

1.

The unit of thermal conductivity is ----- $M^1 L^1 T^{-3} \Theta^{-1}$. **watts per meter-kelvin** (W/(m. K)).

2.

In a flange coupling, the flanges are coupled together by means of

bolts and nuts

3.

Fixed position layout is also known as **static product layout**

4.

Holes of diameter $25.0^{+0.040}_{+0.020}$ mm are assembled interchangeably with the pins of diameter $25.0^{+0.005}_{-0.008}$ mm . The minimum clearance in the assembly will be

0.015 mm

5.

Critical speed of a shaft with a disc supported in between is equal to the natural frequency of the system in **transverse vibrations**

6.

1. The prop reaction of a cantilever beam propped at free end and carrying udl over the whole span is
ans-parabola

7.

The insulation ability of an insulator in the presence of moisture would **decrease**

8.

In inventory control theory, the economic order quantity is **optimum lot size**

9.

Group A	Group B
P. H	I. Shaft Type
Q. IT8	II. Hole Type
R. IT7	III. Hole Tolerance Grade
S. g	IV. Shaft Tolerance Grade

(D) P-II, Q-IV, R-III, S-I

10.

A transmission shaft includes

A. counter shaft

B. line shaft

C. over head shaft

D. all of these 

11.

A beam is fixed at one end and simply supported at the other end. If a moment M is applied at the simply supported end, the moment induced at the fixed end is $\frac{1}{2}$ of the applied moment

12.

The ratio of heat flow Q_1/Q_2 from two walls of same thickness having their thermal conductivities $K_1 = 2K_2$ will be -----.

2

13.

Slenderness ratio is the ratio of

$$\text{Slenderness ratio } (\lambda) = \frac{\text{Effective length}}{\text{Least radius of gyration}} = \frac{L_e}{r}$$

14.

A simply supported beam of span L carries a u.d.l. of w per unit length over the entire span. The strain energy stored by the beam is given by

$$\frac{\beta}{96EI}$$

15.

Production cost refers to prime cost plus **factory overheads**

16.

$$+0.040 \qquad \qquad \qquad +0.030$$

In an interchangeable assembly, shafts of size $25.000^{-0.010}\text{mm}$ mate with holes of size $25.000^{+0.020}\text{mm}$. The maximum interference (in microns) in the assembly is

60 micron

17.

If the rotating mass of a rim type flywheel is distributed on another rim type flywheel whose mean radius is half

the mean radius of the former, then energy stored in the later at the same speed will be

- A. four times the first one
- B. same as the first one
- C. one fourth of the first one
- D. one and a half times the first one

18.

Each screen point is referred to as

.....**Pixels**

19.

Metals are good conductors of heat **because of the close packing of the metalions in the lattice**

20.

A hole is dimension $\phi 9^{+0.015}$ mm. The corresponding shaft is of dimension $\phi 9^{+0.001}$ mm. The resulting assembly has

- transition fit

21.

What is the ratio of the bending moment at the centre of a simply supported beam to the bending moment at the centre of a fixed beam, when both are of same span and both are subjected to same u.d.l

$\frac{24}{15}$

22.

Which one of the following chart gives simultaneously information about the progress of work and machine loading?

- [A]. Process chart
- [B]. Machine load chart
- [C]. Man-machine chart 
- [D]. Gantt chart

23.

Work sampling is applied for

- A. estimation of the percentage utilisation of machine tools
- B. estimating the percentage of the time consumed by various job activities
- C. finding out time standards, specially where the job is not repetitive and where time study by stop watch method is not possible
- D. all of the above 

24.

Which of the following line algorithms used integer only arithmetic to rasterize lines?

Bresenham

25.

A shaft has a dimension, $\phi 35 -0.025$. The respective values of fundamental deviation and tolerance are

-0.009, 0.016

26.

The value of Prandtl number for air is approximately
0.7-0.8 for air

27.

When a single load ‘W’ moves over a simply supported beam, the maximum B.M. at a section will occur when the load is placed.

ans-centre

28.

What are the upper and lower limits of the shaft represented by 60f8?

Use the following data

Diameter step is 50 - 80mm.

Fundamental tolerance unit $i=0.45D^{(1/3)} + 0.001D$, where D is the representative size in mm, Tolerance value for IT8 = 25i,

Fundamental deviation for f shaft = $-5.5D^{0.41}$

Lower limit = 59.924mm, Upper Limit = 59.970mm

29.

Absorptivity of a body equals its emissivity **under thermal equilibrium**

30.

A systematic job improvement sequence will consist of motion study, time study, job enrichment

31.

When a single load W moves over a simply supported beam, the curve for maximum shear force, + ve or – ve will be a

32.

The purpose of refreshing a CRT is
..... **Reduce Flickr**

33.

Which of the following is not an object-space hidden surface removal algorithm?

34.

A simply supported beam and a fixed beam are of same span and same uniform flexural rigidity. If they are subjected to same u.d.l. over the entire span, the deflection at the centre in the case of fixed beam will be

35.

If temperature of a solid surface changes from 300 K to 900 K, then its emissive power changes in the ratio of **81**

36.

0.050

A hole is specified as $40^{+0.000}$ mm. The mating shaft has a clearance fit with minimum clearance of 0.01 mm. The tolerance on the shaft is 0.04 mm. The maximum clearance in mm between the hole and the shaft is

0.10

37.

If the speed of the engine varies between 390 and 410 rpm in a cycle of operation, the coefficient of fluctuation of speed will be

ans-0.05

38.

A diagram showing the path followed by men and materials while performing a task is known as **travel chart** 

39.

The main function of CAD is **design**

40.

In a pin jointed frame the members meeting at a joint must be so arranged that

ans- the axes of all the members are concurrent and coplanar

41.

In time study, the rating factor is applied to determine

- A. standard time of a job**
- B. merit rating of the worker**
- C. fixation of incentive rate**
- D. normal time of a worker** 

42.

The zone of transition between laminar sublayer and turbulent core is called

- (a) **transition zone**
- (b) **buffer layer**
- (c) **boundary layer**
- (d) **none of the above**

ans- b

43.

In a flywheel, the safe stress is 25.2 MN/m² and the density is 7 g/cm³. Then what is the maximum peripheral velocity (in m/s)?

98. (c) $\sigma_\theta = \rho v^2$

25. $2 \times 10^6 = 7 \times 10^{-3} \times 10^6 \times v^2$

$v = 60 \text{ m/s}$

44.

What does N, P and L mean in N.P.L. Gauge interferometer?

ANSWER: National Physics Laboratory

45.

The intercept between a given arch and a linear arch at a section is proportional to

Eddy's theorem states that “ The bending moment at any section of an arch is proportional to the vertical intercept between the linear arch (or theoretical arch) and the centre line of the actual arch.”

46.

A mono-atomic ideal gas ($\gamma = 1.67$, molecular weight = 40) is compressed adiabatically from 0.1 MPa, 300 K to 0.2 MPa. The universal gas constant is 8.314 kJ/molK. The work of compression of the gas (in kJ/kg) is

47.

The chart which gives an estimate about the amount of materials handling between various work stations is known as **travel chart**.

48.

A reciprocating engine, running at 80 rad/s, is supported on springs. The static deflection of the spring is 1mm. Take $g=10 \text{ m/s}^2$. When the engine runs what will be the frequency of vibration of the system?

49.

CAD programs which incorporate parametric modeling utilize a system in which the dimensions control the

- A.** size and shape of the model features ✓
- B.** perspective of the model
- C.** shading used to render the model
- D.** all of the above

50.

The maximum tension in a cable occurs

51.

String diagram is used

- A.** for checking the relative values of various layouts
- B.** when a group of workers are working at a place
- C.** where processes require the operator to be moved from one work place to another
- D.** all of the above ✓

52.

The static deflection of a shaft under a flywheel is 4 mm.
Take $g=10\text{m/s}^2$. What is the critical speed in rad/s? **50**

53.

Imperial standard yard is made of _____

ANSWER: bronze

54.

Friction power of the IC engine will _____ if the engine speed is increased.

55.

During the execution of a CNC part program block N020 G02 X45.0 Y25.0 R5.0 the type of tool motion will be **Clock wise**

56.

Hammer blow **Hammer blow, in rail terminology, refers to a vertical force which alternately adds to and subtracts from the locomotive's weight on a wheel. It is transferred to the track by the driving wheels of many steam locomotives. It is an out-of-balance force on the wheel (known as overbalance)**

57.

The maximum shear stress from a Mohr's circle is given by **Radius of the mohrs circle**

58.

The determination of standard time in a complex job system is best done through

- A. stop watch time study
- B. analysis of micromotions
- C. grouping timing technique
- D. analysis of standard data system ✓

59.

In a turbojet engine, subsequent to heat addition to compressed air, to get the power output, the working substance is expanded in

- A. exit nozzle, which is a constant volume process

- B. exit nozzle, which is essentially an isentropic process**
- C. turbine blades, which is a constant volume process**
- D. turbine blades, which is essentially an isentropic process** ✓

60.

Analytical checking of gears includes checking of

ANSWER: tooth profile

61.

The default position of the UCS icon is positioned at _____ on the AutoCAD grid.

- [A]. 0,0,0** ✓
- [B]. 10,10,10**
- [C]. 20,20,20**
- [D]. None of the above**

62.

If the poisson's ratio of a material is 0.25, the ratio of Modulus of rigidity to the young's modulus is **2/5**

63.

In A-B-C analysis, which class of items are generally large in number? **C**

64.

A nozzle is said to have choked flow when

When the nozzle operates with the maximum mass flow, the nozzle is said to be CHOKED

65.

CAD programs which incorporate parametric modeling utilize a system in which the dimensions control the

-
- A. size and shape of the model features**
 - B. perspective of the model**
 - C. shading used to render the model**
 - D. all of the above**

66.

Which formula is used to calculate diametral pitch?

Calculate	When Defined	Formula
Diametral Pitch (P)	Pitch Diameter (PD) and the Number of Teeth (N)	$P = N / PD$

67.

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 68.

Critical damping is a function of

- A. mass and stiffness**
- B. mass and damping coefficient**
- C. mass and natural frequency**
- D. damping coefficient and natural frequency**

69.

In a gas turbine cycle, the turbine output is 600 kJ/kg, the compressor work is 400 kJ/kg and the heat supplied is

1000 kJ/kg. The thermal efficiency of this cycle is : **20%**
70.

According to Taylor's principle which type of gauge checks both size and geometric features?

. **Go gauge**

71.

The advantage of implementing CAD is to

- 1) Increase in the productivity of the designer**
- 2) Improve the quality of the design**
- 3) Better communications:**

72.

In break even analysis, total cost consists of

- [A]. fixed cost + sales revenue**
- [B]. variable cost + sales revenue**
- [C]. fixed cost + variable cost ✓**
- [D]. fixed cost + variable cost + profit**

73.

Whirling speed of the shaft is the speed at which

- a) Shaft tends to vibrate in longitudinal direction
 - b) torsional vibrations occur
 - c) shaft tends to vibrate vigorously in transverse direction**
 - d) combination of transverse and longitudinal vibration occurs
- 74.

6–39 A household refrigerator with a COP of 1.2 removes heat from the refrigerated space at a rate of 60 kJ/min. Determine (a) the electric power consumed by the refrigerator and (b) the rate of heat transfer to the kitchen air.

Answers: (a) 0.83 kW, (b) 110 kJ/min

Solution The COP and the refrigeration rate of a refrigerator are given. The power consumption and the rate of heat rejection are to be determined.

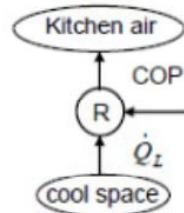
Assumptions The refrigerator operates steadily.

Analysis (a) Using the definition of the coefficient of performance, the power input to the refrigerator is determined to be

$$\dot{W}_{\text{net,in}} = \frac{\dot{Q}_L}{\text{COP}_R} = \frac{60 \text{ kJ/min}}{1.2} = 50 \text{ kJ/min} = 0.83 \text{ kW}$$

(b) The heat transfer rate to the kitchen air is determined from the energy balance,

$$\dot{Q}_H = \dot{Q}_L + \dot{W}_{\text{net,in}} = 60 + 50 = 110 \text{ kJ/min}$$



75.

In a CNC machine tool, encoder is used to sense and control **SPINDLE SPEED**

76.

Direct expenses include

- A. factory expenses**
- B. selling expenses**
- C. administrative expenses**
- D. none of these ✓**

77.

Q. What effect does pitch error have on nut and bolt?

- Published on 07 Aug 15

- a. Major diameter of nut decreases and effective diameter of bolt increases
- b. Effective diameter of nut decreases and effective diameter of bolt increases
- c. Effective diameter of nut increases and effective diameter of bolt decreases
- d. None of the above

ANSWER: Effective diameter of nut decreases and effective diameter of bolt increases

The backlash for spur gears depends upon

- [A]. **module**
- [B]. **pitch line velocity**
- [C]. **tooth profile**
- [D]. **both (a) and (b)**

78.

Interpolation in the controller refers to control of which one of the following in a CNC machine?

- a) Loading/unloading of jobs on machine
- b) Loading/unloading of tools from the tool changer
- c) **Axes of machine for contouring**
- d) Coolant and miscellaneous functions on machine

79.

In a system subjected to damped forced vibrations, the ratio of maximum displacement to the static deflection is known as **Magnification factor**

80.

. **Question 1:** In an internal combustion engine, during the compression stroke the heat rejected to the cooling water is 50 KJ/kg and the work input is 100 KJ/kg. Calculate the change in internal energy of the working fluid stating whether it is a gain or loss.

Solution:

Heat rejected to the cooling water

$$Q = -50 \text{ KJ/kg}$$

$$\text{Work input } W = -100 \text{ KJ/kg}$$

Using the formula,

$$Q = (U_2 - U_1) + W$$

$$-50 = (U_2 - U_1) - 100$$

$$U_2 - U_1 = -50 + 100$$

$$U_2 - U_1 = 50 \text{ KJ/kg}$$

Hence gain in internal energy = **50 KJ/kg**

81.

What is ten point height method?

ANSWER: It is the average difference of five highest points and five deepest valleys measured within sampling length

82.

Which of the following type of layout is suitable for automobile manufacturing concern?

- A. product layout**
- B. process layout**
- C. fixed position layout**
- D. combination layout**

83.

Rankine efficiency of a Steam Power Plant

- a) improves in Summer as compared to that in Winter
- b) improves in Winter as compared to that in Summer

- c) is unaffected by climatic conditions
- d) none of the mentioned

[View Answer](#)

Answer: b

Explanation: In winters, temperature of cooling water is low, which increases Condenser's efficiency

84.

Which of the following statements is true?

85.

Work study involves

Work study involves lot of changes in various working methods

86.

Feed drives in CNC milling machines are provided by
Servo motors

87.

During the execution of a CNC part program block NO20 G02 X45.0 Y25.0 R5.0 the type of tool motion will be

CLOCK WISE

88.

For steady state forced vibrations, the phase lag at resonance is 90

89.

The efficiency of standard Diesel cycle depends on

- cut-off ratio and compression ratio**
- pressure ratio**
- compression ratio**
- temperature limits**

90.

Dispatching **send off to a destination or for a purpose**

91.

Which type of surface in a fringe pattern exhibits the movement of fringes towards the centre?

ANSWER: Dark fringe

92.

The basic transformations include

- a. Translation
- b. Rotation
- c. Scaling
- d. All of these

93.

At which angle does a glass plate reflector set in N.P.L. interferometer?

ANSWER: 45°

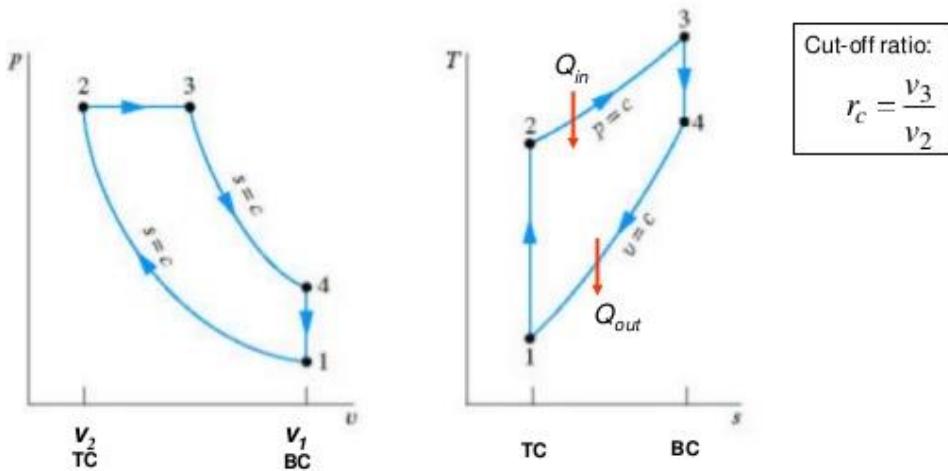
94.

Which process is included in air standard Diesel cycle?

A:

Air-Standard Diesel Cycle

- Process 1 → 2 Isentropic compression
- Process 2 → 3 Constant pressure heat addition
- Process 3 → 4 Isentropic expansion
- Process 4 → 1 Constant volume heat rejection



95.

In order to avoid excessive multiplication of facilities, the layout preferred is

- [A]. product layout
- [B]. process layout
- [C]. group layout
- [D]. static layout

96.

Which type of deviation is observed while calculating hole dimensions?

- a. Positive
- b. Negative

- c. Zero**
- d. All of the above**

97.

Process layout is also known as

- [A]. analytical layout**
- [B]. synthetic layout**
- [C]. static product layout ✓**
- [D]. none of these**

98.

In reciprocating engines primary forces

Are partially balanced

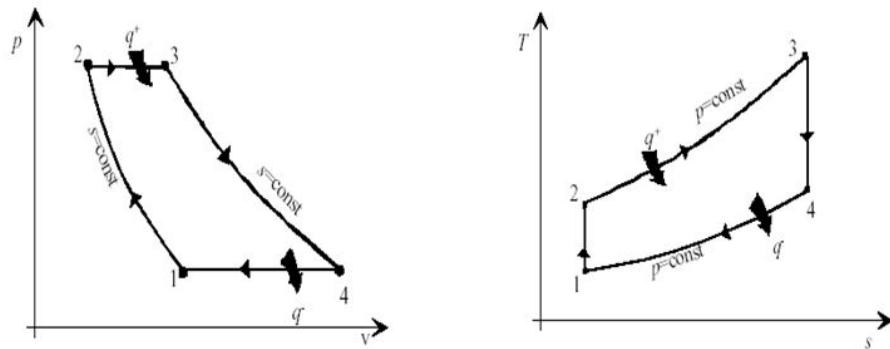
99.

Which one of the following is part of air standard
Brayton cycle?

A:

3. Air Standard Brayton Cycle

P-v Diagram and T-s Diagram of Brayton Cycle



- *Process 1-2: Isentropic compression in the compressor*
- *Process 2-3: Heat Addition at a constant pressure*
- *Process 3-4: Isentropic expansion in a turbine*
- *Process 4-1: Heat Rejection at a constant pressure.*

100.

The transformation in which an object is moved in a minimum distance path from one position to another is called

- a. **Translation**
- b. Scaling
- c. Rotation
- d. Reflection

101.

The snap gauge having go dimension corresponds to

-
- a. maximum metal condition
 - b. minimum metal condition
 - c. minimum material condition

d. none of the above

ANSWER: maximum metal condition

102.

A governor is said to be isochronous when the equilibrium speed for all radii of rotation of the balls within the working range

YES

103.

For handling materials during manufacture of cement, a _____ is widely used

bucket conveyor

104.

Forming products of transformation matrices is often referred as

- a. Composition of matrix
- b. Concatenation of matrix
- c. **Both a & b are same**
- d. None of these

105.

The mean effective pressure of an engine is defined as

$$p_{me} = \frac{2\pi n_r T}{V_d}$$

106.

When the sleeve of a Porter governor moves upwards, the governor speed

- [A]. increases ✓
- [B]. decreases
- [C]. remains unaffected

[D]. first increases and then decreases

107.

In product layout

A: easy

108.

The combines the volumes occupied by overlapping 3D objects using set operations

a) Beam penetration

b) CSG Method

c) Sweep representation

d) All the answer

109.

An Otto cycle operates with volumes of 40 cm³ and 400 cm³ at Top Dead Centre and Bottom Dead Center respectively. If the power output is 100 kW, what is the heat input in kJ/s?

A: answer not found

110.

Fill up the blank

$$\text{Accuracy} = \sqrt{(\text{Repeatability})^2 + (\text{_____})^2}$$

Precision

111.

When the speed of the engine fluctuates continuously above and below the mean speed, the governor is said to be

[A]. stable

[B]. **unstable**

[C]. **isochronous**

[D]. **hunt** ✓

112.

..... is created by revolution of a circle about an axis lying in its plane. **Hollow sphere**

113.

Find the missing term in the equation which represents the standard tolerance unit.

$$i = 0.45\sqrt[3]{D} + \underline{\hspace{2cm}}$$

$$i = 0.45 \times \sqrt[3]{D} + 0.001 \times D$$

114.

Process layout is employed for batch layout

115.

A low wet bulb temperature indicates very _____ humidity. **low**

116.

Cooling with adiabatic humidification Process is known as isothermal humidification

117.

In a four stroke I.C. engine, the turning moment during the compression stroke is
negative throughout ✓

118.

The point about which an object is rotated is called **AXIS**

119.

As the size of a part to be manufactured increases, the tolerance limits within which the part can be manufactured _____ increases
120.

Which one of the following techniques is used for determining allowances in time study?

- A. Acceptance sampling**
- B. Linear regression**
- C. Performance rating**
- D. Work sampling** 

121.

A surface of revolution is generated by a **rotation** of a 2D curve.

122.

The engine of an aeroplane rotates in clockwise direction when seen from the tail end and the aeroplane takes a turn to the left. The effect of the gyroscopic couple on the aeroplane will be

a) **True**

123.

In process layout (Barr baar aayegA)

124.

What description of fit suits the vacant box?

Shafts	Grades	Description of fit	Application
f	6, 7, 8		Lubricated bearings (with oil or grease), pumps and smaller motors, gear boxes

125.

The volumetric efficiency of compressor with increase in compression ratio will increases

126.

Which of the following charts are used for plant layout design?

- A. Operation process chart
- B. Man machine chart
- C. Travel chart
- D. all of these 

127.

Identify line clipping algorithms from the following

- a) Cohen- Sutherland algorithm
- b) Liang-Barsky clipping
- c) Nicholl-Lee-Nicholl clipping
- d) All the answer

128.

A motor car moving at a certain speed takes a left turn in a curved path. If the engine rotates in the same direction as that of wheels, then due to the centrifugal forces

- b) the reaction on the outer wheels increases and on the inner wheels decreases

129.

Describe the fit in relation to the following data

Shafts	Grades	Description of fit	Application
k	5, 6, 7		Precision joints likely to be subjected to vibrations

130.

A two stage compressor takes in air at 1.1. bar and discharges at 20 bar. for minimum compression work, the intermediate pressure is $4.69(\sqrt{p_1 \cdot p_2} = p_{int.})$

131.

A-B-C analysis

A-MIN AND C MAXIMUM

132.

The transformation in which the dimension of an object are changed relative to a specified fixed point is called

Translation

- **Scaling**
- Rotation
- Reflection

133.

A rigid body, under the action of external forces, can be replaced by two masses placed at a fixed distance apart. The two masses form an equivalent dynamical system, if

- A]. the sum of the two masses is equal to the total mass of body**
- [B]. the centre of gravity of the two masses coincides with that of the body**

the sum of mass moment of inertia of the masses about their centre of gravity is equal to the mass moment of inertia of the body

[D]. all of the above 

134.

In a single stage air-compressor, the clearance volume is 1/19th of the swept volume. It delivers 7.6 m³ of free air per minute from 100 kpa to 900 kpa. Assume the index of compression and expansion as 1.2. Find the volumetric efficiency of compressor

135.

What type of fit does the following description represent?

Shafts	Grades	Description of fit	Application
s	5, 6, 7	Semi permanent/permanent fit	Valve seating, collars on shafts

136.

A 20 m³ of air per minute is compressed from 1 bar and 20 degree Celsius to 10.24 bar. Calculate the minimum power required to drive the compressor with 2-stage compression. Assume the index of compression is 1.3

137.

With incremental tool positioning, _____.

a) each tool movement is made with reference to the last tool position

138.

Routing- Routing is the process of selecting a path for traffic in a network

139.

The maximum fluctuation of energy is the

The difference between the maximum and minimum energies is called maximum fluctuation of energy

140.

What is the value of the fundamental tolerance unit "i" for the shaft and hole pair designated by

?

$$T = k^* i$$

$$i = .45 \sqrt[3]{D} + 0.001D$$

$$D = \sqrt{d_1 d_2}$$

141.

By using CIM to control all phases of manufacturing, firms hope to reap what benefits?

*Enhanced
flexibility*

-
-
-

*Improved quality
Increased productivity
All of the above*

142.

Indirect expenses include

- A. factory expenses**
- B. selling expenses**
- C. administrative expenses**
- D. all of these** 

143.

The work input to air compressor is minimum if the compression law followed is

d) $pV = C$

144.

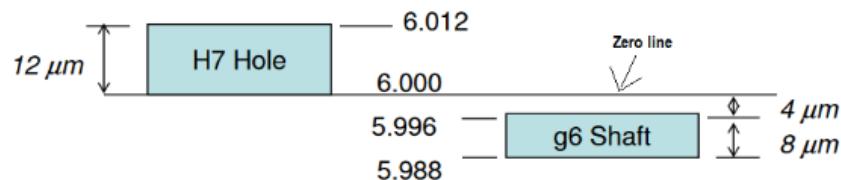
The primary unbalanced force is maximum when the angle of inclination of the crank with the line of stroke is

c) 180 degree

Min. Clearance and Max. Clearan

145.

The figure given below represents the disposition of tolerance zone around the zero line



Find the

Min. Clearance and Max. Clearance= 6-
5.996=4microns, max.=6.012-5.988=24microns

146.

The partial balancing means

B. balancing partially reciprocating masses ✓

147.

Internal diameter of any workpiece can be measured using _____ **Vernier calliper**

148.

Performance rating is equal to

$$\text{Rating Factor} = \frac{\text{Observed Performance}}{\text{Normal Performance}}$$

149.

Which type of model is likely to be created with a rapid prototyping system?

D) Scale model

150.

Find the volumetric efficiency of the compressor if air is compressed from 1 bar to 7 bar. The expansion and compression are isentropic ($n=1.3$) and the clearance volume is 3% of stroke volume.

151.

A reversible thermodynamic cycle containing only three processes and producing work is to be constructed. The constraints are (a) there must be one isothermal process, (b) there must be one isentropic process, (c) the maximum and minimum cycle pressures and clearance volume are fixed and (d) polytrophic processes are not allowed. Then the number of possible cycles is/are

ans-4 cycle

152

According to Muther, the basic principle of best layout is

- [A]. principle of over-all integration
- [B]. principle of flow
- [C]. principle of flexibility
- [D]. all of these

153.

Which of the following is not true of computer numerically controlled (CNC) machines?

They can give better productivity to the process.

- They give more accuracy and precision to the process.
- They can eliminate operator error.
- They can ‘learn’ from process errors.

Ans is D

154.

The swaying couple is maximum or minimum when the angle of inclination of stroke (θ) is equal to

A 90° and 180°

B 45° and 225°

C 180° and 270°

D 270° and 360°

Ans is B

155.

In a locomotive, the maximum magnitude of the unbalanced force along the perpendicular to the line of stroke, is known as

- A tractive force
- B swaying couple
- C hammer blow
- D none of these

Ans is c

156.

What does a symbol D imply in workstudy

- A) transport
- B) delay temporary storage
- C) Dummy transport
- D) inspection

Answer : delay temporary storage

157.What do Flexible Manufacturing systems (FMS) do?

A **flexible manufacturing system (FMS)** is a manufacturing system in which there is some amount of flexibility that allows the system to react in case of changes, whether predicted or unpredicted. A **flexible manufacturing system (FMS)** is a manufacturing system in which there is some amount of flexibility that allows the system to react in case of changes, whether predicted or unpredicted.

158.

Which ISO standard is used in international automobile companies to set automotive quality system standards ?

- a. ISO 14000
- b. TS 16949

- c. ISO 9000
- d. none of the above

ANSWER: TS 16949

159.

For a given set of operating pressure limits of a Rankine cycle, the highest efficiency occurs for

Saturated cycle

- Superheated cycle
- Reheat cycle
- Regenerative cycle

Ans D

160.

A football was inflated to a gauge pressure of 1 bar when the ambient temperature was 15°C. When the game started next day, the air temperature at the stadium was 5°C. Assume that the volume of the football remains constant at 2500 cm³, the amount of heat lost by the air in the football and the gauge pressure of air in the football at the stadium respectively equal to

Ans- 43.7 J, 0.93 bar

161.

The time taken by a trained worker to perform an operation, while working a steady pace, is known as

A standard time
.

E normal time

C representative time

I none of these

Ans -a

162.

A sliding bearing which can support steady loads without any relative motion between the journal and the bearing is called

A zero film bearing

B boundary lubricated bearing

C hydrodynamic lubricated bearing

D hydrostatic lubricated bearing

Ans-d

163.

ISO 14000 quality standard is related with

Ans-environmental management system

164.

Secondary forces in reciprocating mass on engine frame are

Ans-partially balanced

165.

Which of the following temperature scales doesn't have negative numbers?

kelvin

166.

Which of the following is a contact type of automated inspection method?

Ans-Coordinate measuring machine

167.

In a boundary lubricated bearing, there is a of lubricant between the journal and the bearing

ans-**thin film

168.

In order to have a complete balance of the several revolving masses in different planes

[

A] A single mass in different planes

.

[

B] Two masses in any
two planes ✓

.

[

C] A single mass in one of the planes of the revolving masses

.

[

D] Two equal masses in any two planes

.

Answer: Option B

169.

Productivity increases when

Ans- inputs decrease while outputs remain the same.

170.

Which of the following statements is true?

171.

Which of the following is not a therblig?

Ans-It is a time and motion study

172.

In a vibrating system, if the actual damping coefficient is 40 N/m/s and critical damping coefficient is 420 N/m/s, then logarithmic decrement is equal to

[

A 0.2
]

.

[

B 0.4
]

.

[

C 0

] . 

. 6

[

D 0.8
]

.

Answer: Option C

173.

Which of the following could NOT be used to indicate a temperature change? A change in:

A. color of a metal rod.

- B. length of a liquid column.
- C. pressure of a gas at constant volume.
- D. electrical resistance.
- E. mass of one mole of gas at constant pressure

Ans-e

174.

When the bearing is subjected to large fluctuations of load and heavy impacts, the bearing characteristic number should be the bearing modulus.

[

A 5 times
]

.

[

B 10 times
]

.

[

C 15
]
tim ✓
. es

[

D 20 times
]

.

Answer: Option C

175.

If Z = Absolute viscosity of the lubricant in kg/m-s, N = Speed of the journal in r.p.m., and p = Bearing pressure in N/mm², then the bearing characteristic number is

Ans-zn/p

176.

Micromotion study is

A Enlarged view of motion
] study
.

[
C Motion study when seen on
] a time chart
.

[
E Motion study with micro-
] seconds as units
.

Answer: Option D

[
B Analysis of one stage of
] motion chart
.

[
D Sub-division of an
] operation into therbligs and
] their analysis
.

177.

When a body moves with simple harmonic motion, the product of its periodic time and frequency is equal to

[
A zero
] .

[
B O
] n ✓
. e

[
C $\pi/2$
] .

$$[D\pi]$$

.

Answer: Option B

178.

The property of a system that does not change when the system is undergoing adiabatic process

Ans-heat and when reversible it is entropy

179.

Calculate diameter of best wire for a Withworth thread of M 24 x 7 mm size.

- a. 4.04 mm
- b. 7.8 mm
- c. 3.94 mm
- d. 8.08 mm

ANSWER: 3.94 mm

180.

A heat engine takes in some amount of thermal energy and performs 50 J of work in each cycle and rejects 150 J of energy. What is its efficiency?

ans-25

181.

Which of the following methods is unreliable to evaluate the surface finish?

- a. Electrical stylus profilometer
- b. Wallace surface dynamometer
- c. Profilograph
- d. Tomlinson surface tester

ANSWER: Wallace surface dynamometer

182.

If the ratio of frequency of excitation to the natural frequency of vibrations is 1.414, then the transmissibility of vibration will be

Ans-the transmissibility will be equal to unity(1)

183.

**Greater flexibility in plant layout is achieved in case of
Ans-Process layout**

184.

The ball bearings are usually made from

- A low carbon steel
- B high carbon steel
- C medium carbon steel
- D chrome steel

Answer: Option D

185.

Which principle does Taylor-Hobson-Talysurf tester work on?

- a. Capacitive demodulating principle
- b. Intensity modulating principle
- c. Inductive modulating principle
- d. Carrier modulating principle

ans-d

186.

-Routing and Scheduling are integral part of

- A) Product planning
- B) Work study
- C) Job analysis
- D) Quality control

View Answer

Answer : Product planning

187.

In under damped vibrating system, the amplitude of vibration

[

A] decreases linearly with time

.

[

B] increases linearly with time

.

[

C] decreases

] exponentially with ✓
time

[

D] increases exponentially with time

.

Answer: Option C

188.

In radial bearings, the load acts

Ans- In these bearings the main load is perpendicular to the axis of rotation of the moving element.

189.

A rigid container holds an ideal gas ($C_v = 0.75 \text{ kJ/(kg K)}$).

The container is cooled from 110°C to 20°C . Find the specific heat transfer (kJ/kg) for the process

Ans-67.5

190.

When the length of the journal is less than the diameter of the journal, then the bearing is said to be a

Ans-short bearing

191.

Work sampling is applied for

Ans- is the statistical technique for determining the proportion of time spent by workers in various defined categories of activity (e.g. setting up a machine, assembling two parts, idle...etc.).

192.

Which type of light source is used in N.P.L. type of flatness interferometer?

- a. Mercury vapour lamp
- b. Cadmium lamp
- c. Both a. and b.
- d. None of the above

ANSWER: Mercury vapour lamp

193.

Match items in List-I (Process) with those in List-II (Characteristic) and select the correct answer using the codes given below the lists:

List-I	List-II
A. Throttling process done	1. No work
B. Adiabatic process transfer	2. No heat
C. Free expansion internal energy	3. Constant
D. Isothermal process enthalpy	4. Constant

Ans-b-2,c-1,a-4,d-2
194.

The steering of a ship means

a-movement of a complete ship up and down in vertical plane about transverse axis

- B turning of a complete ship in a curve towards right or left,
C rolling of a complete ship side-ways
D none of the above

A
n
s
-
b

195.

Which one of the following chart gives simultaneously information about the progress of work and machine loading?

- A Process chart
- B Machine load chart
- C Man-machine chart

- D Gantt chart

Answer: Option C

196.

The closeness of the measured value to the actual value is

Ans-accuracy

197.

The angular contact ball bearing can be used for Ans- Angular contact bearings better support "combined loads" (loading in both the radial and axial directions) and the contact angle of the bearing should be matched to the relative proportions of each

198.

Think about how a refrigerator works and the system of the refrigerator and the area outside of the refrigerator at ambient temperature. Is the high temperature the body refrigerator or the ambient air around the refrigerator?

Ans-ambient air has high temp

199.

A shaft carrying three rotors will have

- A no node
- B one node
- C two nodes
- D three nodes

Answer: Option C

200.

Which of the following statement is correct?

201.

A bearing is designated by the number 305. It means that a bearing is of

If a bearing is designated by the number 305, it means that the bearing is of

- A light series whose bore is 5 mm
- B light series whose bore is 25 mm
- C medium series whose bore is 5 mm
- D medium series whose bore is 25 mm

Ans-D

202.

A rigid vessel contains pure substance and it passes through the critical state on heating only if the initial state is
Ans..LIQUID(not confirmed)/ saturated liquid vapor

203.

The spherical roller bearing can be used for
Ans-spherical Roller Bearings are commonly used in agricultural machines such as combined harvesting machine, air-blower, paper-machine, textile machine, woodworking machinery, overhead crane moving wheel and driving shaft as well as a large number of non agricultural applications.

204.

The unit cost in case of batch production is _____ as compared to jobbing production.

Ans-less

205.

Side rake angle of a single point cutting tool is the angle

[

A by which the face of the tool is inclined towards back]

.

[

B by which the face of the tool is
] inclined sideways .



.

[

C between the surface of the flank immediately below the
] point and a plane at right angles to the centre line of the
] point of the tool .

.

[

D between the surface of the flank immediately below the
] point and a line drawn from the point perpendicular to the
] base .

Answer: Option B

206.

The temperature recorded by a thermometer when its bulb is surrounded by a wet cloth exposed to air.

Ans-wet bulb temperature

207.

When a rigid body is suspended vertically and it oscillates with a small amplitude under the action of the force of gravity, the body is known as

- A simple pendulum
- B compound pendulum
- C torsional pendulum
- D second's pendulum

Answer: Option B

208.

The spark advance is usually specified in terms of
Ans-degrees of crank rotation

209.

For a product layout the material handling equipment must

Ans-be designed as special purpose for a particular application

210.

If the centre distance of the mating gears having involute teeth is increased, then the pressure angle

- A Increases
- B Decreases
- C

C remains unchanged

∴
Answer: Option A

211.

A measurement system only includes operators and gauges

Ans**

212.

The secondary unbalanced force is maximum _____ in one revolution of the crank.

Ans-4 times

213.

Lewis equation in spur gears is applied

Ans-for tooth calculation

214.

In reciprocating compressors, clearance is provided

Ans- Clearance volume used to find the compression ratio,volumetric efficiency which affects the efficiency of an engine.

215.

Precision is related to the accuracy of the measurements

Ans-yes

216.

Which of the following is independent of sales forecast?

Ans-

217.

The commercial refrigeration system which is closer to reversed carnot cycle in terms of performance is

ans-carnot refrigerator

218.

In helical gears, the distance between similar faces of adjacent teeth along a helix on the pitch cylinders normal to the teeth, is called

ans-normal pitch

219.

For two governors A and B, the lift of sleeve of governor A is more than that of governor B, for a given fractional change in speed. It indicates that

ans-governor a is more sensitive than governor b

220.

Which of the following layouts is suited for mass production?

ans-product layout

221.

This is a solid shape that fits inside the mold and forms a hole in a cooled cast metal or molten plastic object:

ans-core

222.

Performance rating is equal to

- [A]. observed performance + normal performance
- [B]. observed performance - normal performance
- [C]. observed performance x normal performance
- [D].

none of the above @

Answer: Option D

223.

Which of the following is used to control the speed variations of the engine caused by the fluctuations of the engine turning moment?

ans-flywheel

224.

The root angle of a bevel gear is equal to

ans-pitch angle-dedendum angle

225.

Air ($C_p = 1.0 \text{ kJ/kg}$ ratio of specific heat = 1.4) enter a compressor at a temperature of 27 deg.C. The compressor ratio is 4. Assuming an mechanical efficiency of 80%, the compressor work required in kJ/kg is

226.

When a metal is specified as "tough" in the part drawing, the manufacturing engineer should understand that this metal: it can absorb more energy

227.

A system in dynamic balance implies that

- [A]. the system is critically damped
- [B]. there is no critical speed in the system
- [C].

the system is also statically balanced @

- [D]. there will absolutely no wear of bearings

Answer: Option C

228.

In the cost structure of a product, the selling price is determined by the factors such, as ans-fixed cost+variable cost+ptofit

229.

The contact ratio for gears is

- a) zero
- b) less than one
- c) greater than one
- d) none of the mentioned

View Answer

Answer: c

230.

The latent heat load in an auditorium is 25% of sensible heat load. The value of sensible heat factor(SHF) is equal to

ans-0.8

Q.21 Ans:[0.8]

Latent heat load = $0.25 \times$ **Sensible heat load**

$$\text{Sensible heat factor, SHF} = \frac{\text{SH}}{\text{SH} + \text{SL}}$$

$$\text{SHF} = \frac{\text{SH}}{\text{SH} + 0.25\text{SH}} = \frac{1}{1.25}$$

$$\text{SHF} = 0.8$$

231.

Which of the following is the best engineering plastics material that has high tensile strength, high compressive strength, with minimal elongation to use for a product that will be injection molded?

ans-polycarbonate plastic polymer

232.

Which one of the following techniques is used for determining allowances in time study?

ans-. Acceptance sampling

B. Linear regression

C. Performance rating

D. Work sampling

Answer: Option D

233.

In a spring mass vibrating system, the natural frequency of vibration is reduced to half the value when a second spring is added to the first spring in series. Determine the stiffness of the second in terms of that of the first spring.($S_2=S_1/3$)

234.

_____ gives the fraction of air which does not come into contact with heating coil surface

ans-bypass factor

235.

The allowable static stress for steel gears is approximately

_____ of the ultimate tensile stress.

ans-1/3

236.

The best process for making a kitchen drawer divider tray out of plastic sheets is:

18. The best process for making a **kitchen** drawer divider tray out of plastic sheets is:
- A. pulforming
 - B. thermoforming (vacuum forming)**
 - C. compression forming
 - D. blowmolding

Answer is (B) thermoforming (vacuum forming)

237.

A turning operation is to be done on a piece of alloy steel that has a diameter of 90mm. If the depth of cut is set at 3.175 mm, the feed is set at 0.30 mm per revolution, and the recommended cutting speed using a carbide tool is 90 meters per minute, what rotational speed you will set on the machine, from the following available speeds on machine, in rpm?

238.

Fundamental principle of refrigeration is based on

_____ 2nd law _____ law of thermodynamics

239.

Merit Rating is the method of determining worth of

- A. relative values of a job**
- B. worker's performance on a job**
- C. worth of a machine**
- D. value of overall production**

Answer: Option B

240.

What is the minimum damping ratio for an underdamped system such that its overshoot is limited to 10 percent?

241.

When bevel gears having equal teeth and equal pitch angles connect two shafts whose axes intersect at right angle, then they are known as

ans-METRE BEVEL GEAR

242.

The purpose of a riser in a mold is

- A. deliver molten metal into the mould cavity
- B. act as a reservoir for the molten metal
- C. feed the molten metal to the casting in order to compensate for the shrinkage
- D. deliver the molten metal from pouring basin to gate

Answer: Option C

243.

Routing is essential in the following type of industry

- A. assembly industry [Correct Answer]
- B. process industry
- C. job order industry
- D. mass production industry
- E. steel industry.

244.

Humidification or Dehumidification process is also called as

245.

When the spiral angle of a bevel gear is zero, it is called

as_____

ans-spiral bevel gear

246.

If magnification factor is high for constant damping factor

247.

The property of a bearing material which has the ability to accommodate small particles of dust, grit etc., without scoring the material of the journal, is called

ans-embedability

248.

The air refrigeration system is working on
_____ cycle

ans-bell coleman cycle

249.

What type of vibration is predominant in the beam structure?

ans-transverse vibration

250.

Emulsified oils which are used in machine shop are

ans-cutting fluid

251.

The production scheduling is simpler and high volume of output and high labour efficiency are achieved in the case of

- A. **product layout**
- B. **process layout**
- C. **fixed position layout**
- D. **a combination of line and process layout**

Answer: Option A

252.

The disadvantage of product layout is

Ans- The layout is not flexible.

2. Expansion is difficult: 3. Costly..

4. Supervision difficult: 5. Complete stoppage during breakdown:

253.

Non-coplaner concurrent forces are those forces which

Ans- The forces which meet at one point and have their lines of action in different planes

254.

The material used for lining of friction surfaces of a clutch should have coefficient of friction.

Ans-high

255.

Chills are used in moulds to

Ans- in casting mould to achieve directional solidification

256.

A lubrication system in which a scoop connected at the lowest part of the connecting rod is used to spread the lubricating oil on the cylinder wall is called

Ans-splash lubrication

257.

Which of the following statement is correct?

258.

In foundry work, a runner is which one of the following:

(a) channel in the mold leading from the downspur to the main mold cavity, (b) foundryman who moves the molten metal to the mold, or (c) vertical channel into which molten metal is poured into the mold? Answer. (a).

259.

Inventory control in production, planning and control aims at

- A. achieving optimization
- B. ensuring against market fluctuations
- C. acceptable customer service at low capital investment in inventory [Correct Answer]
- D. discounts allowed in bulk purchase
- E. regulate supply and demand.

260.

In case of a multiple disc clutch, if n_1 are the number of discs on the driving shaft and n_2 are the number of the discs on the

driven shaft, then the number of pairs of contact surfaces will be

Ans- n_1+n_2-1

261.

The amount of heat removed from 1 ton (1000 kg) of pure water supplied at 0°C to form ice at 0°C in 24 hours is known as _____

262.

A 40 kW engine has a mechanical efficiency of 80 %. If the frictional power is assumed to be constant with load, what is the approximate value of the mechanical efficiency at 50% of the rated load?

Ans-66%

263.

The cone clutches have become obsolete because of
Ans- strict requirement of coaxiality of two shafts

264.

Total solidification time is defined as which one of the following: (a) time between pouring and complete solidification, (b) time between pouring and cooling to room temperature, (c) time between solidification and cooling to room temperature, or (d) time to give up the heat of fusion?

Ans-a

265.

The allowed time for a job equals standard time plus

- A. policy allowance [Correct Answer]
- B. interference allowance
- C. process allowance
- D. learning allowance
- E. unforeseen allowance.

266.

The principle of transmissibility of forces states that, when a force acts upon a body, its effect is

- [A]. same at every point on its line of action
- [B]. different at different points on its line of action
- [C]. minimum, if it acts at the centre of gravity of the body
- [D]. maximum, if it acts at the centre of gravity of the body

Answer: Option C

267.

In manufacturing management, the term 'Dispatching' is used to describe

- A. dispatch of sales order
- B. dispatch of factory mail
- C. dispatch of finished product of the user
- D. dispatch of work orders through shop floor

Answer: Option D

268.

A jaw clutch is essentially a

Ans-positive action clutch

269.

The angular velocity (in rad / s) of a body rotating at N revolutions per minute is

- A. $\pi N/60$
- B. $\pi N/180$
- C. $2\pi N/60$

D. $2\pi N/180$

Answer: Option C

270.

A refrigerant should have low
Ans-bp,mp and specific heat

271.

In a sand-casting mold, the V/A ratio of the riser should be
Ans- greater than,
the V/A ratio of the casting itself?

272.

According to the law of moments, if a number of coplaner forces acting on a particle are in equilibrium, then

Ans-

[A]. their algebraic sum is zero

[B]. their lines of action are at equal distances

[C]. the algebraic sum of their moments about any point in their plane is zero ✓

the algebraic sum of their moments about any point is

[D]. equal to the moment of their resultant force about the same point.

Answer: Option C

273.

For handling materials during manufacture of cement, a _____ is widely used.

Ans-limestone

274.

Total slip will occur in a belt drive when

Ans- angle of rest is zero

275.

Antiknock character of compression ignition engine fuel is increased by

Ans-

- [A]. tetraethyl lead
- [B]. trimethyl pentane
- [C]. amyl nitrate ✓
- [D]. hexadecane

Answer: Option C

276.

In a sand-casting mold, the V/A ratio of the riser should be greater than,
the V/A ratio of the casting itself?

277.

In sand casting, the volumetric size of the pattern is

Ans-bigger than

278.

In computing the engine performance, the heating value of fuel used is _____

Ans-for calculating lhv

279.

Process layout is employed

Ans-

a-batch production [Correct
Answer]

- B. continuous type of product
- C. effective utilization of machines

- D. all of the above
E. none of the above.

280.

The basic load rating of a ball bearing is

Ans- - static load ratings (C_{or}) and dynamic load ratings (C_r)

281.

The centroid of a semi-circle area lies at a distance of _____ from its base measured along the vertical radius.

Ans- $4r/3\pi$

282.

A body of weight W is required to move up on rough inclined plane whose angle of inclination with the horizontal is α . The effort applied parallel to the plane is given by (where $\mu = \tan\phi$ = Coefficient of friction between the plane and the body.)

Ans-

- A. $P = W \tan\alpha$
B. $P = W \tan(\alpha + \phi)$
C. $P = W (\sin\alpha + \mu \cos\alpha)$
D. $P = W (\cos\alpha + \mu \sin\alpha)$

Answer: Option C

283.

The difference between tensions on the tight and slack sides of a belt drive is 3000 N. if the belt speed is 15 m/s, the transmitted power in kW is

Ans-45kw

284.

What does symbol 'O' imply in work study?

Ans-operation

285.

Superheating in vapour compression refrigeration cycle is
Ans-

- A. does not alter C.O.P.
- B. increases C.O.P.
- C. decreases C.O.P.
- D. none of these

Answer: Option C

286.

Given that W_m = weight of the molten metal displaced by a core and W_c = weight of the core, the buoyancy force is which one of the following?

(a) downward force = $W_m + W_c$, (b) downward force = $W_m - W_c$, (c) upward force = $W_m + W_c$, or (d) upward force = $W_m - W_c$?

Ans-d

287.

The ratio of tension on the tight side to that on the slack side in a flat belt drive is

Ans-exponential function of coff of friction and lap angle

288.

Which of the following materials require largest shrinkage allowance while making a pattern for a casting?

Ans-plain carbon steel

289.

For a small scale industry, the fixed cost per month is Rs. 5000. The variable cost per product is Rs. 20 and sales price is Rs. 30 per piece. The break even production per month will be

Ans=500

290.

Which of the following is a scalar quantity?

- A. Velocity
- B. Speed
- C. Force
- D. Acceleration

291.

The ratio of high temperature to low temperature in reversed carnot cycle refrigerator is 1.1. The COP of the refrigerator will be

Ans-10

292.

The rate of change of momentum is directly proportional to the impressed force, and takes place in the same direction in which the force acts. This statement is known as

Ans-2nd law

293.

0.7 kg/s of air enters with a specific enthalpy of 290 kJ and leaves it with 450 kJ of specific enthalpy. Velocities at inlet and exit are 6 m/s and 2 m/s respectively. Assuming adiabatic process, what is power input to the compressor?

294.

Disposable patterns are made of

Ans-wood and plastic

295.

The type of layout used for manufacturing steam turbines, is

Ans-fixed position layout

296.

A 1.5 kW motor is running at 1440 rev/min, it is to be connected to a stirrer running at 36 rev/min. The gearing arrangement suitable for this application is

Ans-worm gear

297.

The point, through which the whole weight of the body acts, irrespective of its position, is known as

Ans-centRE OF GRAVITY

298.

**Motion study involves analysis of
Ans-**

- A. actions of operator [Correct Answer]
- B. layout of work place
- C. tooling and equipment
- D. all of the above
- E. none of the above

299.

The property of a material which enables it to resist fracture due to high impact loads is known as

Ans-toughness

300.

Which one of the following phenomena occurs when gas in a piston-in-cylinder assembly expands reversibiliy at constant pressure?

Ans-heat is added

301.

The ratio of tension on the tight side to that on the slack side in a flat belt drive is:

A: $e^{\mu\theta}$

302.

For a small scale industry, the fixed cost per month is Rs. 5000. The variable cost per product

is Rs. 20 and sales price is Rs. 30 per piece. The break even production per month will be :

A: 500

303.

The type of layout used for manufacturing steam turbines, is

A: fixed position layout

304.

Disposable patterns are made of

A: polysterene

305.

A 1.5 kW motor is running at 1440 rev/min, it is to be connected to a stirrer running at 36 rev/min. The gearing arrangement suitable for this application is

A:worm gear

306.

0.7 kg/s of air enters with a specific enthalpy of 290 kJ and leaves it with 450 kJ of specific enthalpy.

Velocities at inlet and exit are 6 m/s and 2 m/s respectively. Assuming adiabatic process, what is power input to the compressor?

A: $0.7 * (450 - 290)$

307.

The rate of change of momentum is directly proportional to the impressed force, and takes place in the same direction in which the force acts. This statement is known as:

A: 2nd law of motion

308.

Shrinkage allowance on pattern is provided to compensate for shrinkage when

A: The temperature of the solid phase drops from freezing to room temperature

309.

The property of a material which enables it to resist fracture due to high impact loads is known as :

A: toughness

310.

Motion study involves analysis of

A: actions of operator

311. Which one of the following phenomena occurs when gas in a piston-in-cylinder assembly expands reversibly at constant pressure?

A: heat is added to the gas

312.

The point, through which the whole weight of the body acts, irrespective of its position, is known as

A: centre of gravity

313.

In sand molding, core prints are used to

A: holes/cavities

314. The comfort conditions in air conditioning are at (where DBT = Dry bulb temperature, and RH = Relative humidity)

A: 22°C DBT and 60% RH

315.

A couple produces

A: torque

316.

The average time recorded by work study man for an operation is called

A: representative time

317.

If a load W is applied instantaneously on a bar, then the stress induced in bar will

A: be independent of ratio of mass of load W to mass of bar (y)

318.

In sand molding draft is provided on the:

A: A slight taper, known as **draft**, must be used on surfaces perpendicular to the parting line, in order to be able to remove the pattern from the mold.

319.

The dry bulb temperature lines, on the psychrometric chart are:

A: vertical lines

320.

A rubber ball is dropped from a height of 2 m. If there is no loss of velocity after rebounding, the ball will rise to a height of

A: 2m

321.

If a material fails below its yield point, failure would be due to:

A: fatigue

322.

Indirect expenses include:

A: indirect expenses are not directly related or assigned to the core business operations. Indirect expenses are necessary to keep the business up and running, but they can't be directly related to the cost of the core revenue generating goods/services.

Indirect expenses can be different for different types of companies such as manufacturing, construction, service companies etc.

Indirect expenses are shown on the debit side of an income statement.

Examples

Salaries, Telephone bills, Printing & Stationery, Legal & Accounting charges, Carriage Outwards etc.

323. The total and static pressures at the inlet of a steam nozzle are 186 kPa and 178 kPa respectively. If the total pressure at the exit is 180 kPa and static pressure is 100 kPa, then the loss of energy per unit mass in the nozzle will be:

A:

324.

Time study is carried out to determine the time required to complete job by

A: average worker

325.

In testing a material for endurance strength, it is subjected to:

A: completely reversed load.

326.

The angle of inclination of the plane at which the body begins to move down the plane, is called:

A: angle of repose

327.

Shell moulding requires:

A: **Shell moulding**, also known as **shell-mould** casting, is an expendable mold casting process that **uses** a resin covered sand to form the mold.

328.

Varingon's theorem of moments states that if a number of coplaner forces acting on a particle, then

A: the algebraic sum of their moments about any point is equal to the moment of their resultant force about the same point.

329.

In a vapor compression refrigeration cycle, heat is rejected by the refrigerant in a:

A: condenser

330.

In order to avoid excessive multiplication of facilities, the layout preferred is

A: process layout

331.

In a casting process, fluidity is mostly influenced by

A: freezing of alloys over a temperature range

332.

Guest's theory of failure is applicable for following type of materials

A: ductile

333.

One joule is equal to: 1 calore= 4.2 joules

334.

With the percentage of carbon in steel

A: upto 2.1% by weight

335.

In a psychrometric process, the sensible heat added is 30 kJ/s and the latent heat added is 20 kJ/s. The sensible heat factor for the process will be:

A: 0.6

336.

Father of industrial engineering is:

A: gnatt

337.

Sprue in sand casting refers to

A: A **sprue** is the passage through which liquid material is introduced into a mold. In many cases it controls the flow of material into the mold. During casting or molding, the material in the sprue will solidify and need to be removed from the finished part. This excess material is also called a sprue.

338.

In sand molding, a slick refers to

A: The common form of slick is an oval spoon. It has a flat one on one end and spoon on the other end. It is used for patching and smoothing the mould after the pattern has been withdrawn.

339.

During adiabatic saturation process on unsaturated air _____ remains constant

A: . wet bulb temperature

340.

Moment of inertia of a triangular section of base (b) and height (h) about an axis passing through its vertex and parallel to the base, is _____ than that passing through its C.G. and parallel to the base.

A: 9 times

341.

The maximum percentage of carbon content in cast iron is 4% by weight.

342.

Choose the wrong statement Time study is used to

A:

- A.** determine overhead expenses
- B.** provide a basis for setting piece prices or incentive wages
- C.** determine standard costs

- D.** determine the capability of an operator to handle the number of machines
- E.** compare alternative methods.

ans is A

343.

In most machine members, the damping capacity of the material should be

A:

- A.** low
- B.** zero
- C.** high
- D.** could be anything
- E.** none of the above.

ans is C

344.

According to lami's theorem:

A: $a/\sin a = b/\sin b = c/\sin c$

345.

The difference between dry bulb temperature and wet bulb temperature, is called:

A: wet bulb depression

346.

The purpose of sprue is to

A: A **sprue** is the passage through which liquid material is introduced into a mold. In many cases it controls the flow of material into the mold. During casting or molding, the material in the sprue will solidify and need to be removed from the finished part. This excess material is also called a sprue.

347.

Works cost implies

A:

- A. primary cost
- B. factory cost
- C. factory expenses
- D. primary cost + factory expenses
- E. none of the above.

ans is D

348.

Sub-cooling in a refrigeration cycle

A: The term **subcooling** refers to a liquid existing at a temperature below its normal boiling point. For example, water boils at 373 K; at room temperature (300 K) the water is termed "subcooled". A subcooled liquid is the convenient state in which, say, refrigerants may undergo the remaining stages of a refrigeration cycle.^[1] Normally, a refrigeration system has a subcooling stage, allowing technicians to be certain that the quality, in which the refrigerant reaches the next step on the cycle, is the desired one. Subcooling may take place in heat exchangers and outside them.

349.

Stress concentration is caused due to;

A:

- A. variations in load acting on a member
- B. variations in properties of materials in a member
- C. abrupt change of cross-section
- D. all of these

Answer: Option C

350. The coefficient of restitution for inelastic bodies is:

A: zero

351.

In sand mold, the purpose of gate is to

GATES

- A gate is a channel which connects runner with the mould cavity and through which molten metal flows to fill the mould cavity.
- A small gate is used for a casting which solidifies slowly and vice versa.

A:

352.

A refrigeration cycle operates between condenser temperature of + 27°C and evaporator temperature of -23°C. The Carnot coefficient of performance of cycle will be:

A: $250/50 = 5$

353.

Resilience of a material is important, when it is subjected to

A:

- A.** combined loading
- B.** fatigue
- C.** thermal stresses
- D.** wear and tear
- E.** shock loading.

ans is E

354.

Which of the following charts are used for plant layout design?

A:

- A.** Operation process chart
- B.** Man machine chart
- C.** Travel chart
- D.** all of these

Answer: Option D

355.

A lead ball with a certain velocity is made to strike a wall, it falls down, but rubber ball of same mass and with same velocity strikes the same wall, it rebounds. Select the correct reason from the following:

A:

- A.** both the balls undergo an equal change in momentum
- B.** the change in momentum suffered by rubber ball is more than the lead ball
- C.** the change in momentum suffered by rubber ball is less than the lead ball
- D.** none of the above

Answer: Option B

356.

The purpose of riser is to

A: A **riser**, also known as a feeder, is a reservoir built into a metal casting mold to prevent cavities due to shrinkage.

357.

Euler equation for turbomachines is derived on the basis of:

A: These **equations** can be **derived from** the moment of momentum **equation** when applied for a pump or a turbine.

358.

Factor of safety is the ratio of

A: a. allowable stress to critical stress

- b. critical stress to allowable stress
- c. normal stress to shear stress
- d. shear stress to normal stress

Correct Answer : b. critical stress to allowable stress

359.

In sand molding there is no need to provide one of the following allowance, it is

A: These are the allowances which are usually provided in a pattern.

- shrinkage allowance
- Draft allowance
- Distortion or camber allowance
- Rapping or Shaking allowance
- Finishing allowance

360.

In vapour compression refrigeration system, refrigerant occurs as liquid and vapour between:

A:in evaporator (between expansion and compressor)

361.

A ladder is resting on a smooth ground and leaning against a rough vertical wall. The force of friction will act

A: upwards on the ladder by the rough wall

362.

In a vapour compression refrigeration cycle, the flow of refrigerant is controlled by:

A: expansion valve

363.

Slow plastic deformation of metals under a constant stress is known as

A:

[A]. Fatigue

[B]. Proof deformation

[C]. Gradual deformation

[D]. Creep

[E]. Endurance failure

Answer: Option D

364.

The purpose of chaplets in a mould is to

A: **Chaplets** are used to support a core from the bottom, or to anchor it from the top to prevent floating.

365.

48. Which of the following statement is correct in connection with projectiles?

A. A path, traced by a projectile in the space, is known as trajectory.

B. The velocity with which a projectile is projected, is known as the velocity of projection.

C. The angle, with the horizontal, at which a projectile is projected is known as angle of projection.

D. all of the above

Answer: Option D

366. Two solid circular shafts of radii R_1 and R_2 are subjected to same torque. The maximum shear stresses developed in the

two shafts are 1 t and 2 t . If $R_1/R_2=2$, then 2 t / 1 t is _____.

A:

7. Two solid circular shafts of radii R_1 and R_2 are subjected to same torque. The maximum shear stresses developed in the two shafts are τ_1 and τ_2 . If $R_1/R_2=2$, then τ_2/τ_1 is _____

Answer: 7.9 to 8.1

Exp: $\tau = \frac{16T}{\pi d^3}$

$$\Rightarrow \frac{\tau_2}{\tau_1} = \left(\frac{d_1}{d_2} \right)^3 = \left(\frac{R_1}{R_2} \right)^3 = 2^3 = 8.$$

367.

In centrifugal compressor terminology, vane-less space refers to the space between

A: the impeller exit and diffuser inlet

368.

Where does the lowest temperature occur in a vapour compression cycle ?

A: just before the evaporator

369.

In metrology, a feeler gauge is used to check

A: to measure gap widths

370.

The acceleration of a body sliding down an inclined surface is

A: draw FBD

371.

In surface roughness measurements, the term "secondary texture" represents _____

- The surface irregularities of considerable wavelength of a periodic character are known as waviness or secondary texture.
- These irregularities are caused due to misalignment of centres, lack of straightness of guideways and non-linear feed motion.
- These includes irregularities of first and second order.
- Waviness errors are intermediate in wavelength between roughness and form error.

A:

372.

Two forces are acting at an angle of 120° . The bigger force is 40N and the resultant is perpendicular to the smaller one. The smaller force is

A:

- [A]. 20 N ✓
- [B]. 40 N
- [C]. 80 N
- [D]. none of these

Answer: Option A

373.

In product layout

374.

A solid circular shaft of 60 mm diameter transmits a torque of 1600 N.m. The value of maximum shear stress developed is

$$A: f_s = \frac{16T}{\pi d^3} = \frac{16 \times 1600}{\pi \times (0.06)^3} = 37.72 \text{ MPa}$$

375.

Combustion in compression ignition engines is:

A: heterogeneous

376.

Tomlinson's surface meter and Taylor Hobson Talysurf are _____ instruments

A: direct measurement instruments for surface roughness

377.

The centroid a T-section 100 mm x 150 mm x 50 mm from its bottom is

378.

- [A]. 50mm
- [B]. 75mm
- [C]. 87.5mm ✓
- [D]. 125mm

Answer: Option C

To reduce the possibility of knock in the C.I. engines, the first elements of fuel and air should have

- a) high temperature
- b) high density
- c) short delay
- d) all of the mentioned

[View Answer](#)

A: Answer: d

379.

A solid shaft of diameter, d length and length L is fixed at both ends. A torque, T_0 is applied at a distance $L/4$ from the left end. The maximum shear stress in the shaft is

A: $12T_0/\pi d^3$

380.

The detonation tendency in petrol engines for specified conditions of fuel rating, compression ratio, speed etc. can be controlled by having

- a) smaller cylinder bore
- b) bigger cylinder bore
- c) medium cylinder bore
- d) none of the mentioned

[View Answer](#)

A: Answer: a

381.

Slip gauges are _____ gogauge_____ standards

382.

The range of projectile on a downward inclined plane is _____ the range on upward inclined plane for the same velocity of projection and angle of projection.

A:

- A.** less than
- B.** more than
- C.** equal to

Answer: Option **B**

383.

A solid circular shaft needs to be designed to transmit a torque of 50 Nm. If the allowable shear stress of the material is 140 MPa, assuming a factor of safety of 2, the minimum allowable design diameter in mm is

$$T = \frac{\pi}{16} \times \tau_{\text{permissible}} \times d^3$$

$$50 \times 10^3 = \frac{\pi}{16} \times \frac{140}{2} \times d^3$$

A: $d = 16 \text{ mm}$

384.

A company spends considerable amount on publicity to promote sales. This expenditure in break even chart is shown below the

A:

- A.** fixed cost line
- B.** variable cost line
- C.** total cost line
- D.** sales revenue line

Answer: Option **B**

385.

The piston rod and the crosshead in a steam engine are usually connected by means of

A:

- [A]. knuckle joint
- [B]. cotter joint 
- [C]. oldham coupling
- [D]. universal joint

Answer: Option B

386.

Dial gauge is a _____ A dial gauge is a precision measurement commonly used to measure machined parts for production tolerances or wear. Dial gauges are capable of producing extremely fine measurement values

387.

Supercharging is the process of

- A:
- a. heating the fuel at sufficient temperature so that it can burn easily
 - b. making proper mixture of air and fuel according to load requirement
 - c. pressurizing the air supplied to an internal combustion engine
 - d. all of the above

Correct Answer: c. pressurizing the air supplied to an internal combustion engine

388.

If the resultant of two equal forces has the same magnitude as either of the forces, then the angle between the two forces is

A: 60 degree

389.

Square key of side "d/4" each and length l is used to transmit torque "T" from the shaft of diameter "d" to the hub of a pulley. Assuming the length of the key to be equal to the thickness of the pulley, the average shear stress developed in the key is given by

A:

$$(a) \frac{4T}{ld}$$

$$(b) \frac{16T}{ld^2}$$

$$(c) \frac{8T}{ld^2}$$

$$(d) \frac{16T}{\pi d^3}$$

Ans. (c) If a square key of sides $d/4$ is used then. In that case, for shear failure we have $\left(\frac{d}{4} \times 1\right) \tau_x \frac{d}{2} = T$

$$\text{or } \tau_x = \frac{8T}{ld^2} \quad [\text{Where } \tau_x \text{ is the yield stress in shear and } l \text{ is the key length.}]$$

390.

The knocking in diesel engines for given fuel, will be

A:

- A.** enhanced by decreasing compression ratio
- B.** enhanced by increasing compression ratio
- C.** dependent on other factors
- D.** none of the above

Answer: Option A

391.

Among the various terminologies related to surface roughness, 'Ra' represents _____

A: **Ra** is the arithmetic average of the roughness profile,

392.

The main objective of work measurement is to
A: **Work measurement** is the application of techniques designed to establish the time for an average worker to carry out a specified manufacturing task at a defined level of performance.

393.

Moment of inertia of a circular section about an axis perpendicular to the section is

A: $(\pi \cdot d^4)/32$

394.

The least measurement that can be detected by a measuring instrument is _____

A: least count

395.

A 60 mm long and 6 mm thick fillet weld carries a steady load of 15 kN along the weld. The shear strength of the weld material is equal to 200 MPa. The factor of safety is

$$P_{PFW} = 0.707 t \times L_e \times \tau_s, \text{ (where PFW = Parallel fillet weld)}$$

$$\Rightarrow \frac{15 \times 10^3}{0.707 \times 6 \times 60} = \tau_s$$

$$\therefore \tau_s = 58.7344 \text{ MPa}$$

Given the shear strength of the material = 200 MPa

A: $\therefore \text{Factor of safety} = \frac{200}{58.9344} = 3.4$

396.

Ignition quality of diesel-fuel oil is expressed by an index called

A:

- a) octane number
- b) cetane number
- c) calorific value
- d) none of the mentioned

[View Answer](#)

Answer: b

Explanation: Cetane number is defined as the ignition quality of diesel fuel oil is expressed by an index.

397.

If a rigid body is in equilibrium under the action of three forces, then

- A. these forces are equal
- B. the lines of action of these forces meet in a point
- C. the lines of action of these forces are parallel
- D. (b) and (c) above
- E. none of the above.

[Add to Fav](#)

[View Answer](#)

 1  -1

[Explanation:-](#)

A: Answer : D

398.

In fixed position layout

A: In a **fixed position layout**, personnel, supplies, and equipment are brought to the site where the product will be assembled, rather than the product being moved through an assembly line or set of assembly stations.

399.

In a gib and cotter joint, the gib and cotter are subjected to

- A. single shear only
- B. double shear only
- C. single shear and crushing
- D. double shear and crushing

[View Answer/Explanation](#)

[Correct Answer is D](#)

A:

400.

Two coplanar couples having equal and opposite moments

- A. balance each other
- B. produce a couple and an unbalanced force
- C. are equivalent
- D. can not balance each other

Add to Fav

[View Answer](#)

 1  -1

[Explanation:-](#)

A: Answer : D

401.

The ratio of actual whirl velocity to the ideal whirl velocity in the centrifugal compressor is called as

- A: a. velocity factor
- b. slip factor
- c. work factor
- d. none of the above

ANSWER: slip factor

402.

Fuel consumption with increase in back pressure in engine will

A: Exhaust system components such as mufflers and exhaust aftertreatment devices are a source of engine exhaust **back pressure**. Increased **back pressure** levels can cause increased emissions, increased fuel consumption, and can negatively **affect** engine **performance**

403.

The closeness of the measured value to the actual value is _____ **accuracy**

404.

The coefficient of friction depends on

A: The **friction** force depends on two **factors**: a) The materials that are in contact. The two materials and the nature of their surfaces. ... b) The force pushing the two surfaces together. Pushing the surfaces together causes the more of the asperities to come together and increases the surface area in contact with each other.

405.

The comparators eliminate the _____ answer not found

406.

Thermal efficiency of high speed diesel engine at design load may be of the order of

A:

- a) 15%
- b) 30%
- c) 50%
- d) 70%

[View Answer](#)

Answer: d

Explanation: The thermal efficiency of diesel engines is about 70% while the thermal efficiency of petrol and gas engines is about 30%.

407.

A spur gear transmitting power is connected to the shaft with a key of rectangular section. The type (s) of stresses developed in the key is fare.

- A:
- a) Shear stress alone
 - b) Bearing stress alone
 - c) Both shear and bearing stresses
 - d) Shearing, Bearing and Bending stresses

Answer: c) Key develops both shear and bearing stresses

408.

A single force and a couple acting in the same plane upon a rigid body

A: A force and a couple acting in the same plane upon a rigid body are equivalent to a single force, equal and parallel to the original single force.

409.

A systematic job improvement sequence will consist of

A:

- A. motion study
- B. time study
- C. job enrichment
- D. all of these

Answer: Option D

410.

The ratio of indicated thermal efficiency to the corresponding air standard cycle efficiency is called
A: relative efficiency

411.

The scientist 'Carl Edvard Johansson' invented

A: gauge block

412.

In a fillet welded joint, the weakest area of the weld is

A:

- A) Toe
- B) Root
- C) Throat
- D) Face

View Answer

Answer : Throat

413.

In petrol engine using a fixed octane rating fuel and fixed compression ratio, super charging will

A:

- A. not effect

B. decrease

C. increase

Answer: Option C

414.

A body moves, from rest with a constant acceleration of 5 m per sec. The distance covered in 5 sec is most nearly

A: easy

415.

A double fillet welded joint with parallel fillet weld of length L and leg B is subjected to a tensile force P. Assuming uniform stress distribution, the shear stress in the weld is given by

A:

[A]. $\frac{\sqrt{2} P}{s.l}$

[B]. $\frac{P}{2 s.l}$

[C]. $\frac{P}{\sqrt{2} s.l}$

[D]. $\frac{2 P}{s.l}$

Answer: Option C

416.

An axial flow compressor stage is suitable for

A: jet engines, high speed ship engines, and small scale power stations. They are also used in industrial applications such as large volume air separation plants, blast furnace air, fluid catalytic cracking air, and propane dehydrogenation. Due to high performance,

high reliability and flexible operation during the flight envelope, they are also used in aerospace engines.

417.

Primary standards are kept at all leading industries across the globe

A: A **primary standard** in metrology is a standard that is sufficiently accurate such that it is not calibrated by or subordinate to other standards. Primary standards are defined via other quantities like length, mass and time. Primary standards are used to calibrate other standards referred to as working standards

418.

If petrol is used in a diesel engine, then

A: **Diesel** doesn't ignite so well, but burns much better through compression. **Petrol engines** inject the air/fuel mixture and **then use** spark plugs to ignite the mixture just after a piston reaches top dead centre. **Diesel engines** compress air, and **then add** air/fuel mixture. As a result they run hotter.

419.

A boat is traveling along a circular path having a radius of 20 m. Determine the magnitude of the boat's acceleration if at a given instant the boat's speed is $v = 5 \text{ m/s}$ and the rate of increase in speed is $v = 2 \text{ m/s}^2$.

- A. $a = 2.00 \text{ m/s}^2$
- B. $a = 2.36 \text{ m/s}^2$
- C. $a = 1.25 \text{ m/s}^2$
- D. $a = 12.50 \text{ m/s}^2$

A: **Answer:** Option B

420.

The bolts in a rigid flanged coupling connecting two shafts transmitting power are subjected to

- (a) shear force and bending moment
- (b) axial force
- (c) torsion
- (d) torsion and bending moment

A: Solution: (a)

421.

The closeness among the measured value is _____ accuracy

422.

In aircraft gas turbines, the axial flow compressor is preferred because

A: high mass flow rate

423.

In metrology, angular measurements are made using
_ sine bar _____

424.

A clutch has outer and inner diameters 100 mm and 40 mm respectively. Assuming a uniform pressure of 2 MPa and coefficient of friction of liner material 0.4, the torque carrying capacity of the clutch is

Outer diameter,

$$2r_1 = 100 \text{ mm}$$

$$r_1 = 50 \text{ mm} = 0.05 \text{ m}$$

Inner diameter,

$$2r_2 = 40 \text{ mm}$$

$$r_2 = 20 \text{ mm}; r_2 = 0.02 \text{ m}$$

Friction coefficient,

$$\mu = 0.4$$

Torque carrying capacity for uniform pressure theory is

$$\begin{aligned} T &= \frac{2}{3} \mu P \pi (r_1^3 - r_2^3) \\ &= \frac{2}{3} \times 0.4 \times 2 \times 10^6 \times \pi (0.05^3 - 0.02^3) \\ &= 196.035 = 196 \text{ Nm} \end{aligned}$$

A: Hence, the correct option is (b).

425.

A force acting on a body may

- A. introduce internal stresses
- B. balance the other forces acting on it
- C. retard its motion
- D. change its motion
- E. all of the above.

[Add to Fav](#)

[View Answer](#)

1 -1

Explanation:-

A: Answer : E

426.

Inter cooling in compressors

A: Inter cooling purpose is to reduce the temperature of the

compress gas which reduce its volume, so the work done by

the compressor will be less for less volume, which will reduce the input power.

after the inter cooler there should be a separator to prevent any liquid from entering the compressor.

427.

An axial flow compressor has

A: An **axial compressor** is a compressor that can continuously pressurize gases. It is a rotating, airfoil-based compressor in which the gas or working fluid principally flows parallel to the axis of rotation, or axially. This differs from other rotating compressors such as centrifugal compressors, axi-centrifugal compressors and mixed-flow compressors where the fluid flow will include a "radial component" through the compressor.

The energy level of the fluid increases as it flows through the compressor due to the action of the rotor blades which exert a torque on the fluid. The stationary blades slow the fluid, converting the circumferential component of flow into pressure.

428.

Total slip will Occur in a belt drive when

A: angle of rest is zero

429.

If a number of forces act simultaneously on a particle, it is possible

- (a) not a replace them by a single force
- (b) to replace them by a single force
- (c) to replace them by a single force through C.G.
- (d) to replace them by a couple
- (e) to replace them by a couple and a force.

A: Ans: b

430.

In metrology, calibration is performed to _____

A: Calibration is a fundamental (but often overlooked) step in the process of measurement. It ensures that the instrument which is used for testing accurately indicates the required measurement parameter and that the instrument is performing to its specification.

431.

A compressor at high altitude will draw

A: less power

432.

In a centrifugal pump, water enters

A:

- [A]. axially
- [B]. radially ✓

Answer: Option B

433.

In a nozzle, whole frictional loss is assumed to occur between

A:

- A. inlet and throat
- B. inlet and outlet
- C. throat and exit
- D. all of these

Answer: Option C

434.

Which of the following do not have identical dimensions ?

- (a) Momentum and impulse
- (b) Torque and energy
- (c) Torque and work
- (d) Kinetic energy and potential energy
- (e) Moment of a force and angular momentum.

Ans: e

A:

435.

Error of measurement = _____

A: The standard **error of measurement**(SEm) is a **measure** of how much **measured** test scores are spread around a “true” score. The SEm is especially meaningful to a test taker because it applies to a single score and it uses the same units as the test.

436.

Multi stage centrifugal pumps in parallel connection are used to

A: increase flow rate of water

437.

Which one of the following is not a friction clutch?

- A: (A) Fluid clutch
- (B) Centrifugal clutch
- (C) Cone clutch
- (D) Disc clutch

ans is A

438.

If the intake air temperature of I.C. engine increases, its efficiency will

A: decrease

439.

The weight of a body is due to

- (a) centripetal force of earth
- (b) gravitational pull exerted by the earth
- (c) forces experienced by body in atmosphere
- (d) force of attraction experienced by particles
- (e) gravitational force of attraction towards the center of the earth.

A: Ans: e

440.

Which one of the following belts should not be used above 40°C?

A: balata belts

441.

A centrifugal pump delivers water at the rate of 50 litres/s against a total head of 40 metres. Then the power required to drive the pump is

A: 19.62 kw

442.

The ability by which a measuring device can detect small differences in the quantity being measured by it, is called its _____ sensitivity_____

443.

Which one of the following helps in avoiding cavitation in centrifugal pumps?

A:

- [A]. the suction pressure should be high ✓
- [B]. the delivery pressure should be high
- [C]. the suction pressure should be low
- [D]. the delivery pressure should be low

Answer: Option A

444.

Two balls of equal mass and of perfectly elastic material are lying on the floor. One of the ball with velocity v is made to struck the second ball. Both the balls after impact will move with a velocity

- [A]. v
- [B]. $v/2$ ✓
- [C]. $v/4$
- [D]. $v/8$

Answer: Option B

Explanation:

No answer description available for this question.

 Workspace

 Report

Divya said: (Nov 24, 2012)

Conservation of momentum

$$mv = m_1v_1 + m_2v_2$$

$$mv = mv' + mv'$$

$$v' = v/2$$

A:

445.

Comparing an unknown with a standard through calibrated system is called _____

A: indirect comparison
446.

Which type of gear is used for shaft axes having an offset?

A: hypoid gears
447.

The curved lines on a psychrometric chart indicates:
check

A: relative humidity
448.

Moment of inertia of a triangular section of base (b) and height (h) about an axis passing through its C.G. and parallel to the base, is

[A]. nine times

[B]. six times

A: [C]. four times

[D]. two times

Answer: Option A

449.

When two shafts are neither parallel nor intersecting, power can be transmitted by using

A: worm gear

450.

One tonne of refrigeration (1TR) means that the heat removing capacity is

A: 3.5kj/s

600. A Kaplan turbine is an axial flow reaction turbine.

- 601 Concurrent forces, are those forces whose lines of action
- A) Lie on the same line
 - B) Meet at one point
 - C) Meet on the same plane
 - D) None of these

[View Answer](#)

Answer : Meet at one point

Vernier Bevel Protractor is used to measure and check the angles of a job to the accuracy of 5' (5 minutes)

2. A bevel protractor is a graduated circular protractor with one pivoted arm used for measuring or marking off angles. Sometimes [Vernier scales](#) are attached to give more precise readings. It has wide application in architectural and mechanical drawing, although its use is decreasing with the availability of modern drawing software or [CAD](#).

A body is subjected to a tensile stress of 1200 MPa on one plane and another tensile stress of 600 MPa on a plane at right angles to the former. It is also subjected to a shear stress of 400 MPa on the same planes. The maximum normal stress will be

- [A]. 400 MPa
- [B]. 500 MPa
- [C]. 900 MPa
- [D].

1400 MPa @

Answer: Option D

A body is subjected to a tensile stress of 1200 MPa on one plane and another tensile stress of 600 MPa on a plane at right

angles to the former. It is also subjected to a shear stress of 400 MPa on the same planes. The maximum shear stress will be

- A. 400 MPa
- B. 500 MPa
- C. 900 MPa
- D. 1400 MPa

Answer: Option B

An eutectoid steel consists of

[A].

Wholly pearlite @

[B]. wholly austenite

[C]. pearlite and ferrite

[D]. pearlite and cementite

Answer: Option A

The motion of a particle round a fixed axis is

A. Translator

B. Rotary

C. Circular

D. Translatory as well as rotatory.

Answer: Option C

Which of the following components of reaction turbine increases the head on the turbine by an amount equal to the height of runner outlet above the tail race?

- Published on 16 Sep 15

- a. Scroll casing
- b. Guide vanes
- c. Moving vanes

d. Draft tube

ANSWER: Draft tube

If a number of forces are acting at a point, their resultant will be inclined at an angle θ with the horizontal, such that

- A. $\tan \theta = \sum H / \sum V$
- B. $\tan \theta = \sum V / \sum H$
- C. $\tan \theta = \sum V_x \sum H$
- D.

Answer: Option B

Shock resisting steels should have

- [A]. low wear resistance
- [B]. low hardness
- [C]. low tensile strength
- [D]. toughness @

Answer: Option D

q. Steam enters the rotor of a reaction turbine with an absolute velocity of 236 m/s and the relative velocity of 132 m/s. It leaves the rotor with a relative velocity of 232 m/s absolute velocity of 126 m/s. The specific work output is 36.3kw

q. Production. Cast iron is made by re-melting pig iron, often along with substantial quantities of iron, steel, limestone, carbon (coke) and taking various steps to remove undesirable contaminants. Phosphorus and sulfur may be burnt out of the **molten** iron, but this also burns out the carbon, which must be replaced.

Which of the following operating systems is used with CAD systems?

- A) DOS
- B) UNIX
- C) Linux
- D) **all of the above**

4.

Whenever a force acts on a body and the body undergoes a displacement, then

- A. work is said to be done
- B. power is being transmitted
- C. body has kinetic energy of translation
- D. none of these

Answer: Option A

Consider the following statements:

- 1. Almost all flow losses take place in the diverging part of a nozzle.**
- 2. Normal shocks are likely to occur in the converging part of a nozzle.**
- 3. Efficiency of reaction turbines is higher than that of impulse turbines.**

Of these statements

Which of the followings are the demerits of single impulse stage

- 1. Requirement of C-D nozzle
- 2. Enhanced shock associated losses
- 3. More boundary layer associated losses in comparison with single reaction stage

CAD programs which incorporate parametric modelling utilize a system in which the dimensions control the

- A. size and shape of the model features**
- B. perspective of the model**
- C shading used to render the model**
- D. all of the above**

Answer: Option A

Cast iron is a

- A. ductile material**
- B. malleable material**
- C. brittle material**
- D. tough material**

Answer: Option C

The hardness is the property of a material due to which it

- A. can be drawn into wires**
- B. breaks with little permanent distortion**
- C. can cut another metal**
- D. can be rolled or hammered into thin sheets**

Answer: Option C

The rate of doing work is known as

- [A]. potential energy
- [B]. kinetic energy
- [C]. Power
- [D]. none of these

Answer: Option C

The stagnation pressure rise in a centrifugal compressor takes place

- [A]. in the diffuser only
- [B]. in the impeller only
- [C]. in the diffuser and impeller ✓
- [D]. in the inlet guide vanes only

Answer: Option C

The pressure rise in the impeller of centrifugal compressor is achieved by centrifugal forces

Malleable cast iron is produced

- A. by adding magnesium to molten cast iron
- B. by quick cooling of molten cast iron
- C. from white cast iron by annealing process
- D. none of these

Answer: Option C

Stalling of blades in axial- flow compressor is the phenomenon of

The resultant of the two forces P and Q is R . If Q is doubled, the new resultant is perpendicular to P . Then

- [A]. $P = Q$
- [B]. $Q = R$ ✓
- [C]. $Q = 2R$
- [D]. none of these

Answer: Option B

The percentage of carbon in cast iron varies from

- A. 0.1 to 0.5
- B. 0.5 to 1
- C. 1 to 1.7
- D. 1.7 to 4.5

Answer: Option D

20. When the spring of a watch is wound, it will possess

- [A]. strain energy ✓
- [B]. kinetic energy
- [C]. heat energy
- [D]. electrical energy

Answer: Option A

Brass is an alloy of

- A. copper and zinc

- B.** copper and tin
- C.** copper, tin and zinc
- D.** none of these

Answer: Option A

Considering the variation of static pressure and absolute velocity in an impulse steam turbine, across one row of moving blades

- (A) Both pressure and velocity decrease
- (B) Pressure decreases but velocity increases
- (C) Pressure remains constant, while velocity increases
- (D) Pressure remains constant, while velocity decreases

35. The total energy possessed by a system of moving bodies
- [A]. is constant at every instant ✓
 - [B]. varies from point to point
 - [C]. is maximum in the start and minimum at the end
 - [D]. is minimum in the start and maximum at the end

Answer: Option A

the quenching of steel from the upper critical point results in a fine grained structure.

[A]. Agree ✓

[B]. Disagree

Answer: Option A

The overall efficiency of the compressor is
____GREATER_____ than the stage efficiency

The matter contained in a body, is called

[A]. impulsive force [B]. mass

[C]. weight [D]. momentum

Answer: Option B

The pressure of the working fluid changes in both stator and rotor for a impulse stage of turbine

In a CAD package, mirror image of a 2D point P (5, 10) is to be obtained about a line which passes through the origin and makes an angle of 45°

counter clockwise with the X-axis. The coordinates of the transformed point will be (10,5)

- . When the steel is normalised, its
 - [A]. yield point increases
 - [B]. ductility decreases
 - [C]. ultimate tensile strength increases
 - [D]. all of these ✓

Answer: Option D

What is the ratio of isentropic work to Euler work in an centrifugal compressor called?

- Published on 16 Sep 15

- a. Work coefficient
- b. Velocity coefficient
- c. Pressure coefficient
- d. Flow coefficient

ANSWER: Pressure coefficient

During the execution of a CNC part program block NO20 GO2 X45.0 Y25.0 R5.0 the type of tool motion will be

- A) circular Interpolation — clockwise
- B) circular Interpolation — counter clockwise
- C) linear Interpolation
- D) rapid feed

Answer : (A)

The ratio of actual whirl velocity to the ideal whirl velocity in the centrifugal compressor is called as

- Published on 16 Sep 15

- a. velocity factor
- b. slip factor
- c. work factor
- d. none of the above

ANSWER: slip factor

The shape of the Bezier curve is controlled by **control points**

The lower critical point for all steels is 723C

The energy possessed by a body by virtue of its position is called: PE

- . In order to completely specify angular displacement by a vector, it must fix
 - A.** direction of the axis of rotation
 - B.** magnitude of angular displacement
 - C.** sense of angular displacement
 - D.** all of these

Answer: Option D

The material in which the atoms are arranged regularly in some directions but not in others, is called

- A.** amorphous material
- B.** mesomorphous material
- C.** crystalline material
- D.** none of these

Answer: Option B

The degree of the B-spline with varying knot vectors increases with knot vectors

For a zero percent reaction stage of axial flow turbine, $\beta_2 = \beta_3$

If a body is acted upon by a number of coplanar non-concurrent forces it may

- A. Rotate about itself without moving
- B. Move in any one direction
- C. Move in any direction rotating about itself
- D. All the above**

Iron-carbon alloys containing 1.7 to 4.3% carbon are known as

- [A].** eutectic cast irons
- [B].** hypo-eutectic cast irons 

[C]. hyper-eutectic cast irons

[D]. none of these

Answer: Option B

The Initial Graphics Exchange Specification (IGES) (pronounced eye-jess) is a vendor-neutral file format that allows the digital exchange of information among computer-aided design (CAD) systems.

Vaneless diffusers are suitable for _____.

- Published on 16 Sep 15

a. only low pressure rise

b. only high pressure rise

c. both low as well as high pressure rise

ANSWER: only low pressure rise

The diffuser blades are kept _____ the number of impeller blades .

- Published on 16 Sep 15

a. 1/10 th of

b. 1/3 rd of

c. 10 times

d. 3 times

ANSWER: 1/3 rd of

- . A number of forces acting at a point will be in equilibrium, if

- [A]. all the forces are equally inclined
- [B]. sum of all the forces is zero
- [C]. sum of resolved parts in the vertical direction is zero (i.e. $\sum V = 0$) ✓
- [D]. none of these

Answer: Option C

Group technology and CAPP are the activities of

.....

The hardness of steel increases if it contains

- A. Pearlite
- B. Ferrite
- C. Cementite
- D. Martensite

Answer: Option C

In process annealing, the hypo-eutectoid steel is

- [A]. heated from 30° C to 50° C above the upper critical temperature and then cooled in still air
- [B]. heated from 30° C to 50° C above the upper critical temperature and then cooled suddenly in a suitable cooling medium
- [C]. heated from 30° C to 50° C above the upper critical temperature and then cooled slowly in the furnace

- [D]. heated below or close to the lower critical temperature and then cooled slowly ✓

Answer: Option D

The function of _____ is to convert high kinetic energy of gases into pressure energy.

- Published on 16 Sep 15

- a. impeller
- b. diffuser
- c. casing
- d. None of the above

ANSWER: diffuser

B-Rep is a methods of **3-D_solid modelling**

Which is the correct statement about law of polygon of forces?

The Law of Polygon of Forces states that

- A.** if a polygon representing the forces acting at point in a body is closed, the forces are in equilibrium
if forces acting on a point can be represented in magnitude and direction by the sides of a polygon
- B.** taken in order, then the resultant of the forces will be represented in magnitude and direction by the closing side of the polygon

- if forces acting on a point can be represented of a polygon taken in order, their sides of a polygon
- C.** taken in order, their resultant will be represented in magnitude and direction by the closing side of the polygon, taken in opposite order
- if forces acting on a point can be represented in
- D.** magnitude and direction by the sides of a polygon in order, the forces are in equilibrium.

Answer: Option C

6 The tool of an NC machine has to move along a circular arc from (5,5) to (10,10) while performing an operation. The centre of the arc is at (10,5). Which one of the following NC tool path commands performs the above mentioned operation?

- A) N010 G02 X10 Y10 X5 Y5 R5
- B) N010 G03 X10 Y10 X5 Y5 R5
- C) N010 G01 X5 Y5 X10 Y10 R5
- D) N010 G02 X5 Y5 X10 Y10 R5

Answer : (D)

Two non-collinear parallel equal forces acting in opposite direction **constitute a couple**

the maximum number of jets, generally, employed in an impulse turbine without jet interference are

- [A]. Two

[B]. Four

[C]. six

[D]. eight

Answer: Option C

The lower critical temperature

[A]. decreases as the carbon content in steel increases

[B]. increases as the carbon content in steel increases

[C]. is same for all steels

[D]. depends upon the rate of heating

Answer: Option C

The product of either force of couple with the arm of the couple is called

- A. resultant couple
- B. moment of the forces
- C. resulting couple
- D. moment of the couple
- E. **none of the above.**

What are the main components of an NC machine?

1. Part program 2. Machine Control Unit 3. Servo meter

Answer is : 1,2,3

Preheating of parent metal plates before welding is done to.....soften the metal structure.

Centre of gravity of a solid cone lies on the axis at the height

- A. one-fourth of the total height above base
- B. one-third of the total height above base
- C. one-half of the total height above base
- D. three-eighth of the total height above the base
- E. none of the above.

Which of the following are the rules of programming NC machine tools in APT language?

- 1. only capital letters are used 2. A period is placed at the end of each statement 3. Insertion of space does not affect the APT word**

Which of the following statement is correct as regard to water wheels?

- A. They have slow speeds.
- B. They are suitable even for low water heads.
- C. They give constant efficiency, even if the discharge is not constant
- D. all of the above

Answer: Option D

the 2-m-long bar is confined to move in the horizontal and vertical slots A and B. If the velocity of the slider block at A is 6 m/s, determine the bar's angular velocity and the velocity of block B at the instant $\theta = 60^\circ$.

- [A]. $\omega_{AB} = 3.46 \text{ rad/s}$ ↗, $v_B = 3.46 \text{ m/s}$ 9 ✓
- [B]. $\omega_{AB} = 3.00 \text{ rad/s}$ ↗, $v_B = 3.00 \text{ m/s}$ 9
- [C]. $\omega_{AB} = 3.00 \text{ rad/s}$ ↗, $v_B = 6.00 \text{ m/s}$ 9
- [D]. $\omega_{AB} = 6.00 \text{ rad/s}$ ↗, $v_B = 10.39 \text{ m/s}$ 9

Answer: Option A

Which of the following is not an impulse turbine?

- A. Girad turbine
- B. Turgo turbine
- C. Pelton wheel
- D. Kaplan turbine

Answer: Option D

Metal better weldable with itself is.....mild steel.....

A race car starting from rest moves along a straight track with an acceleration as shown in the graph (where for $t \geq 10 \text{ s}$, $a = 8 \text{ m/s}^2$). Determine the time t for the car to reach a speed of 50 m/s.

- A. $t = 11.25 \text{ s}$
- B. $t = 6.25 \text{ s}$
- C. $t = 12.5 \text{ s}$
- D. $t = 3.53 \text{ s}$

Answer: Option A

30. The value of stress concentration factor depends upon

- [A]. material of the part
- [B]. geometry of the part
- [C]. material and geometry of the part ✓
- [D]. none of these

Answer: Option C

Stress concentration is caused due to

- A. variations in load acting on a member
- B. variations in properties of materials in a member
- C. abrupt change of cross-section
- D. all of these

Answer: Option C

The resistance to fatigue of a material is measured by

- A. elastic limit
- B. Young's modulus
- C. ultimate tensile strength
- D. endurance limit

Answer: Option D

Dye penetrant method is generally used to locate

- [A]. core defects
- [B]. surface defects
- [C]. superficial defects
- [D]. temporary defects

Answer: Option B

In fusion welding, porosity defect is due to **liquid metal bubbles**.

U tube Manometer is needed for measuring large gauge pressures and vacuum pressure.

Closed packed hexagonal space lattice is found in

- A. zinc, magnesium, cobalt, cadmium, antimony and bismuth
- B. gamma-iron, aluminium, copper, lead, silver and nickel
- C. alpha-iron, tungsten, chromium and molybdenum
- D. none of the above

Answer: Option A

The ratio of static friction to dynamic friction is always

- A. equal to one
- B. less than one
- C. greater than one
- D. none of these

Answer: Option C

The static temperature and Mach number at the inlet of a centrifugal compressor are 303 K and 0.5 respectively. The stagnation temperature of the air at the inlet will be:

The hardness and tensile strength in austenitic stainless steel can be increased by

[A]. hardening and cold working ✓

[B]. normalising

[C]. Martempering

[D]. full annealing

Answer: Option A

When $n = 1.3$ and $\gamma = 1.4$, the polytropic efficiency of a turbine is

In welding copper alloys with TIG arc welding

[A]. direct current with straight polarity is used ✓

[B]. direct current with reversed polarity is used

[C]. alternating current is used

[D]. any one of these

Answer: Option A

In welding magnesium with TIG arc welding, direct current with _____ is used.

[A]. straight polarity

[B]. reversed polarity ✓

Answer: Option B

The stress induced in a body, when suddenly loaded, is _____ the stress induced when the same load is applied gradually.

- A. equal to
- B. one-half
- C. Twice
- D. four times

Answer: Option C

In kaplan runner, the number of blades is generally of the order of

- 1 - 2.
- 3 - 6.
- 16 - 24.
- 12 - 16.

The runner blade in Kaplan turbine is less than other water turbine. It is in order of 3 to 6.

In Francis turbine runner, the number blades is usually of the order of

- 3 - 6.
- 6 - 8.
- 12 - 14.
- 16 - 24.

The runner blade of Francis turbine is order 16 to 24.

Francis, Kaplan and propeller turbines fall under the category of

- Reaction turbine.

- Impulse turbine.
- Impulse-reaction combined.
- Axial flow.

The reaction turbine have a runner that always functions within a completely water filled casing. So the Kaplan, Francis and propeller are the reaction turbine.

The bending moment at a point on a beam is the algebraic _____ of all the moments on either side of the point.

[A]. sum

[B]. difference

Answer: Option A

A package is dropped from the plane which is flying with a constant horizontal velocity of $v_A = 150 \text{ ft/s}$ at a height $h = 1500 \text{ ft}$. Determine the radius of curvature of the path of the package just after it is released from plane at A.

[A]. $\rho_2 = 9860 \text{ ft}$

[B]. $\rho_2 = 3000 \text{ ft}$

[C]. $\rho_2 = 1500 \text{ ft}$

[D]. $\rho_2 = 8510 \text{ ft}$

Answer: Option D

A turbine develops 10000 kW under a head of 25 meters at 135 r.p.m. Its specific speed is.... $N^*(\text{sq root of } Q)/H^{3/4} = 1207.5$

The advantage of thermite welding is that

- A. all parts of the weld section are molten at the same time
- B. weld cools almost uniformly
- C. results in a minimum problem with internal residual stresses
- D. all of the above

Answer: Option D

In arc welding, the temperature of heat produced by the electric arc is of the order of

- [A]. 3000° C to 4000° C
- [B]. 4000° C to 5000° C
- [C]. 5000° C to 6000° C
- [D]. 6000° C to 7000° C 

Answer: Option D

Exothermic welding, also known as **exothermic bonding**, **thermite welding (TW)**,^[1] and **thermit welding**,^[1] is a welding process that employs molten metal to permanently join the conductors. The process employs an exothermic reaction of a thermite composition to heat the metal, and requires no external source of heat or current. The chemical reaction that produces the heat is an aluminothermic reaction between aluminium powder and a metal oxide.

Q. Deformation per unit length is called as _____

- Published on 01 Sep 15

- a. strain
- b. stress
- c. modulus of elasticity
- d. none of the above

ANSWER: strain

A thin cylindrical shell of diameter (d), length (l) and thickness (t) is subjected to an internal pressure (p). The ratio of longitudinal strain to hoop strain is

A. $\frac{m - 2}{2m - 1}$

B. $\frac{2m - 1}{m - 2}$

C. $\frac{m - 2}{2m + 1}$

D. $\frac{2m + 1}{m - 2}$

Answer: Option A

In a thick cylindrical shell subjected to an internal pressure (p), the tangential stress across the thickness of a cylinder is

- A.** maximum at the outer surface and minimum at the inner surface
- B.** maximum at the inner surface and minimum at the outer surface

C. maximum at the outer surface and zero at the inner surface

D. maximum at the inner surface and zero at the outer surface

Answer: Option B

Submerged arc welding (SAW) is a common arc welding process. The first patent on the submerged-arc welding (SAW) process was taken out in 1935 and covered an electric arc beneath a bed of granulated flux. Originally developed and patented by Jones, Kennedy and Rothermund, the process requires a continuously fed consumable solid or tubular (metal cored) electrode.^[1] The molten weld and the arc zone are protected from atmospheric contamination by being "submerged" under a blanket of granular fusible flux consisting of lime, silica, manganese oxide, calcium fluoride, and other compounds. When molten, the flux becomes conductive, and provides a current path between the electrode and the work. This thick layer of flux completely covers the molten metal thus preventing spatter and sparks as well as suppressing the intense ultraviolet radiation and fumes that are a part of the shielded metal arc welding (SMAW) process.

For harnessing low variable water heads, the suitable hydraulic turbine with high percentage of reaction and runner adjust vanes is

- Francis.
- Pelton.
- Kaplan.
- Impeller.

Kaplan is used for run-of-river and poundage stations with heads of up to 61 m (low head). This type has an axial flow rotor with variable pitch blades.

The v - s graph for a rocket sled is shown. Determine the acceleration of the sled when $s = 100$ m and $s = 175$ m.

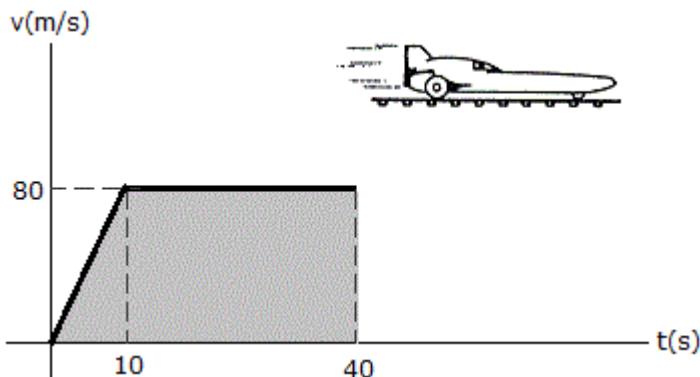
- A. $a_{100} = 3.75 \text{ m/s}^2$, $a_{175} = -1.250 \text{ m/s}^2$
- B. $a_{100} = 11.11 \text{ m/s}^2$, $a_{175} = -25.0 \text{ m/s}^2$
- C. $a_{100} = 0.333 \text{ m/s}^2$, $a_{175} = -1.000 \text{ m/s}^2$
- D. $a_{100} = 33.3 \text{ m/s}^2$, $a_{175} = -25 \text{ m/s}^2$

Answer: Option B

The pilot of fighter plane F is following 1.5 km behind the pilot of bomber B . Both planes are originally traveling at 120 m/s. In an effort to pass the bomber, the pilot in F gives his plane a constant acceleration of 12 m/s 2 . Determine the speed at which the pilot in the bomber sees the pilot of the fighter plane pass at the start of the passing operation the bomber is decelerating at 3 m/s 2 . Neglect the effect of any turning.

- A. $v_{F/B} = 150 \text{ m/s}$
- B. $v_{F/B} = 367 \text{ m/s}$
- C. $v_{F/B} = 90 \text{ m/s}$
- D. $v_{F/B} = 212 \text{ m/s}$

Answer: Option D



From experimental data, the motion of a jet plane while traveling along a runway is defined by the v-t graph shown. Find the position s and the acceleration a when $t = 40$ s.

- A.** $s = 2.80 \text{ km}$, $a = 2.00 \text{ m/s}^2$
- B.** $s = 2.80 \text{ km}$, $a = 0$
- C.** $s = 2.80 \text{ km}$, $a = 2.67 \text{ m/s}^2$
- D.** $s = 2.80 \text{ km}$, $a = 8.37 \text{ m/s}^2$

Answer: Option B

- A Curtis stage, Rateau stage and a 50% reaction stage in a steam turbine are examples of
- (A) different types of impulse stages
 - (B) different types of reaction stages
 - (C) a simple impulse stage, a velocity compounded impulse stage and reaction stage
 - (D) a velocity compounded impulse stage, a simple impulse stage and a reaction stage

A thick cylindrical shell having r_o and r_i as outer and inner radii, is subjected to an internal pressure (p). The maximum tangential stress at the inner surface of the shell is

[A]. $\frac{p(r_o^2 + r_i^2)}{r_o^2 - r_i^2}$

[B]. $\frac{p(r_o^2 - r_i^2)}{r_o^2 + r_i^2}$

[C]. $\frac{2pr_i^2}{r_o^2 - r_i^2}$

[D]. $\frac{r_o^2 - r_i^2}{2pr_i^2}$

Answer: Option A

Which of the following components of reaction turbine increases the head on the turbine by an amount equal to the height of runner outlet above the tail race?

- Published on 16 Sep 15

- a. Scroll casing
- b. Guide vanes
- c. Moving vanes
- d. Draft tube

ANSWER: Draft tube

In gas welding the maximum flame temperature occurs at

- [A]. The tip of the flame [B]. The inner cone
- [C]. The outer cone [D]. Next to the inner cone
- [E]. Inside the inner cone

Answer: Option **D**

A car, initially at rest, moves along a straight road with constant acceleration such that it attains a velocity of 60 ft/s when $s = 150$ ft. Then after being subjected to another constant acceleration, it attains a final velocity of 100 ft/s when $s = 325$ ft. Determine the average velocity and average acceleration of the car for the entire 325-ft displacement.

rest $\rightarrow s_1(d=50\text{m}, v=20\text{m/s}) \rightarrow s_2(d=200\text{m}, v=30\text{m/s})$

$$v_{ave1} = (v_f + v_i)/2 = (20+0)/2 = 10\text{m/s}$$

$$t_1 = d/v = 50/10 = 5\text{s}$$

$$v_{ave2} = (v_f + v_i)/2 = (30+20)/2 = 25\text{m/s}$$

$$t_2 = d/v = (200-50)/25 = 6\text{s}$$

$$t = t_1 + t_2 = 11\text{s}$$

$$v(\text{average}) = d/t = 200/11 = 18.181 = 18.2[\text{m/s}]$$

$$a(\text{average}) = 2d/t^2 = (2*200)/11^2 = 3.3057 = 3.31[\text{m/s}^2]$$

In the torsion equation $\frac{T}{J} = \frac{\tau}{R} = \frac{C\theta}{I}$ the term J/R is called

A. shear modulus

B. section modulus

C. polar modulus

D. none of these

Answer: Option C

Strain resetters are used to

A. measure shear strain

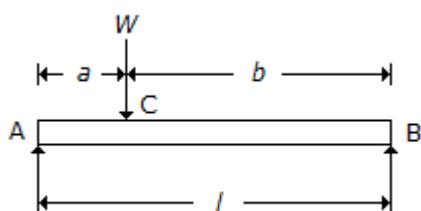
B. measure linear strain

C. measure volumetric strain

D. relieve strain

Answer: Option B

For a beam, as shown in the below figure, when the load W is applied in the centre of the beam, the maximum deflection is



A. $\frac{Wl^3}{48EI}$

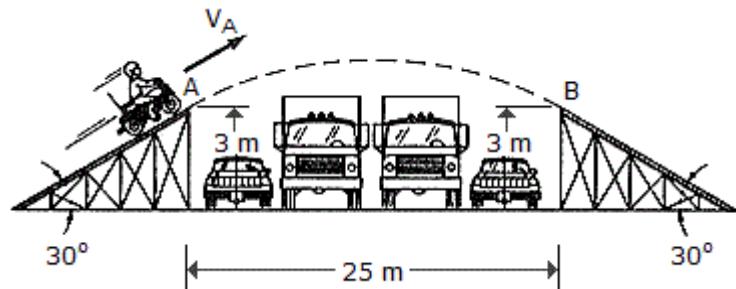
B. $\frac{5Wl^3}{384EI}$

C. $\frac{Wl^3}{192EI}$

D. $\frac{Wl^3}{384EI}$

Answer: Option A

A typical value of temperature obtained in a plasma jet torch may be of the order of **28000 °C (50000 °F)** against **about 5500 °C (10000 °F)**



The motorcyclist attempts to jump over a series of cars and trucks and lands smoothly on the other ramp, i.e., such that his velocity is tangent to the ramp at *B*. Determine the launch speed v_A necessary to make the jump.

- A. $v_A = 11.90 \text{ m/s}$
- B. $v_A = 11.07 \text{ m/s}$
- C. $v_A = 16.83 \text{ m/s}$
- D. $v_A = 15.66 \text{ m/s}$

Answer: Option C

Which of the following property is desirable in parts subjected to shock and impact loads?

- A. Strength
- B. Stiffness
- C. Brittleness
- D. Toughness

Answer: Option D

Which of the following turbine is preferred for 0 to 25 m head of water?

- A.** Pelton wheel
- B.** Kaplan turbine
- C.** Francis turbine
- D.** none of these

Answer: Option B

Examples of Reaction turbines are:

- Francis Wheel
- Kaplan (Propeller)
- Archimedes Screw

Examples of Impulse turbines are:

- Pelton
- Turgo
- Cross Flow (or Banki)

If the end of the cable at A is pulled down with a speed of 2 m/s, determine the speed at which block B arises.

- A.** $v_B = 4.00 \text{ m/s} \downarrow$
 - B.** $v_B = 1.000 \text{ m/s} \uparrow$
-

C. $v_B = 1.000 \text{ m/s} \downarrow$

D. $v_B = 4.00 \text{ m/s} \uparrow$

Answer: Option B

Which of the followings are the demerits of single impulse stage

1. Requirement of C-D nozzle
2. Enhanced shock associated losses
3. More boundary layer associated losses in comparison with single reaction stage

The welding set up is said to have reversed polarity when the work is connected to the negative terminal and the electrode holder to the positive terminal.

[A]. Agree 

[B]. Disagree

Answer: Option A

The torque transmitted by a solid shaft of diameter (D) is (where τ = Maximum allowable shear stress)

A. $\frac{\pi}{4} \times \tau \times D^3$

B. $\frac{\pi}{16} \times \tau \times D^3$

C. $\frac{\pi}{32} \times \tau \times D^3$

D. $\frac{\pi}{64} \times \tau \times D^3$

Answer: Option B

When a rectangular beam is loaded transversely, the maximum compressive stress is developed on the

- A.** top layer
- B.** bottom layer
- C.** neutral axis
- D.** every cross-section

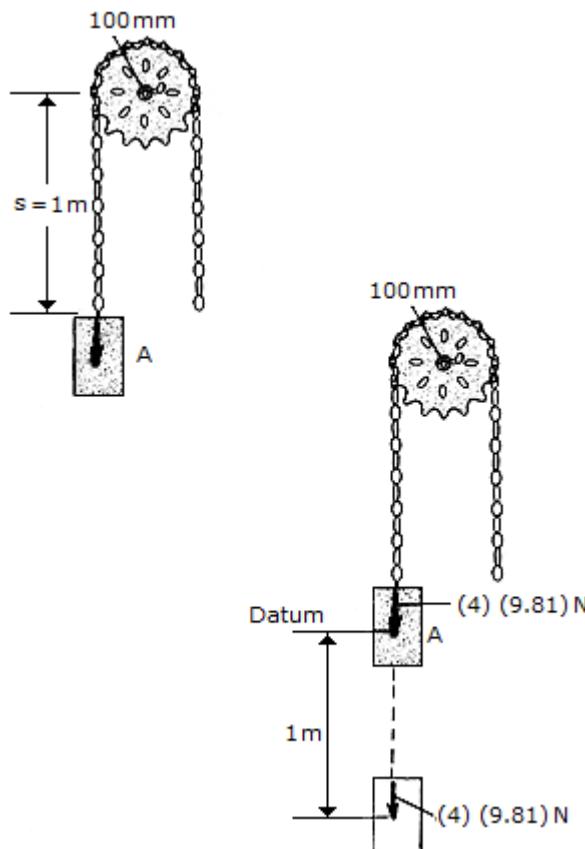
Answer: Option B

The correct amperage setting primarily depends on the diameter and type of electrode you select. The electrode manufacturer usually indicates the electrodes operating ranges on the box or enclosed materials.

Spot welding process is difficult for

- a. stainless steel
- b. copper
- c. magnesium
- d. none of the above

Correct Answer: c. magnesium



A chain that has a negligible mass is draped over a sprocket which has a mass of 2 kg and a radius of gyration of $k_0 = 50\text{ mm}$. If the 4-kg block A is released from rest in the position shown, $s = 1\text{ m}$, determine the angular velocity which the chain imparts to the sprocket when $s = 2\text{ m}$.

- [A]. $\omega = 44.3\text{ rad/s}$
- [B]. $\omega = 39.6\text{ rad/s}$
- [C]. $\omega = 41.8\text{ rad/s}$ ✓
- [D]. $\omega = 59.1\text{ rad/s}$

Answer: Option C

Which one of the following is used to bring down the speed of an impulse steam turbine to practical limits?

Compounding of the turbine

Which of the following welding process uses non-consumable electrodes?

- [A]. TIG welding ✓
- [B]. MIG welding
- [C]. Manual arc welding
- [D]. Submerged arc welding

Answer: Option A

An impulse turbine produces 50 kW of power when the blade mean speed is 400 m/s. What is the rate of change of momentum tangential to the rotor?

$$P=F \cdot V$$

$$F = 50000/400 = 125 \text{ N}$$

In a circular pipe of certain length carrying oil at a Reynolds number 100, it is proposed to triple the discharge. If the viscosity remains unchanged, the power input will have to be

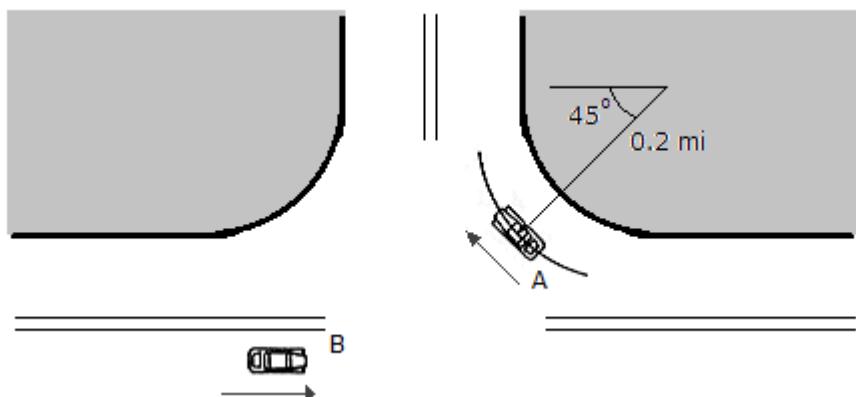
Answer is: increased to 9 times of original value.

Ratio of oxygen to acetylene for complete combustion is
Acetylene: C_2H_2

Balanced combustion reaction of acetylene is
 $\text{C}_2\text{H}_2 + 5/2\text{O}_2 \rightarrow 2\text{CO}_2 + \text{H}_2\text{O}$

Ratio of **oxygen to acetylene** in above balanced equation is

$$5/2 : 1 = 5 : 2$$



As the instant shown, cars *A* and *B* are traveling at speeds of 20 mi/h and 45 mi/h, respectively. If *B* is accelerating at 1600 mi/h² while *A* maintains a constant speed, determine the magnitudes of the velocity and acceleration of *A* with respect to *B*.

- A.** $v_{A/B} = 33.9 \text{ mi/h}$, $a_{A/B} = 1600 \text{ mi/h}^2$
- B.** $v_{A/B} = 60.8 \text{ mi/h}$, $a_{A/B} = 1600 \text{ mi/h}^2$
- C.** $v_{A/B} = 33.9 \text{ mi/h}$, $a_{A/B} = 1426 \text{ mi/h}^2$
- D.** $v_{A/B} = 60.8 \text{ mi/h}$, $a_{A/B} = 1426 \text{ mi/h}^2$

Answer: Option D

When a rectangular beam is loaded transversely, the maximum compressive stress is developed on the

- [A]. top layer
- [B]. bottom layer ✓
- [C]. neutral axis
- [D]. every cross-section

Answer: Option B

An oil of kinematic viscosity 0.25 stokes flows through a pipe of diameter 10cm. The flow is critical at a velocity of

- 7.2m/ s
 - 5m/ s
 - 0.5m/ s
 - 0.72m/ s
- Solution:

$$R_e = 2000 = \frac{vD}{\nu}$$

$$v = 0.5 \text{ m/s}$$

Oil of viscosity 1.5 Pa.s and relative density 0.9 flows through a circular pipe of diameter 5cm with a mean velocity of 1.2 m/s. The shear stress at the wall in Pa is
Solve kro

For a short time the missile moves along the parabolic path $y = (18 - 2x^2)$ km. If motion along the ground is measured as $x = (4t - 3)$ km, where t is in seconds, determine the magnitudes of the missile's velocity and acceleration when $t = 1$ s.

Correct Answer: $v = 16.49 \text{ km/s}$, $a = 64.0 \text{ km/}$

When a machine member is subjected to torsion, the torsional shear stress set up in the member is

- A. zero at both the centroidal axis and outer surface of the member
- B. maximum at both the centroidal axis and outer surface of the member**
- C. zero at the centroidal axis and maximum at the outer surface of the member
- D. maximum at the centroidal axis and zero at the outer surface of the member

Answer: Option B

A shaft is subjected to fluctuating loads for which the normal torque (T) and bending moment (M) are 1000 N-m and 500 N-m respectively. If the combined shock and fatigue factor for bending is 1.5 and combined shock and fatigue factor for torsion is 2, then the equivalent twisting moment for the shaft is

- A. 2000 N-m
 - B. 2050 N-m**
 - C. 2100 N-m
 - D. 2136 N-m
-

Answer: Option D

Sqrt [(2*1000)^2 + (1.5*500)^2].

If two pieces of different metals are to be welded by projection welding, then the projection should be done on the metal piece having.....

Answer nahi h sorry Projection welding is a resistance welding process of joining two sheets or a sheet and a thick component, or a small component like nut to a big body like automotive chassis, by making raised portions or projections on one of the components, where weld nugget is required to be made.

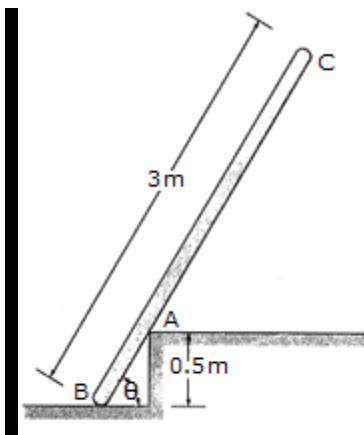
Thus projection welding is not confined to welding sheets, instead any two surfaces which can be brought together, to give point or line contact, can be projection welded. The raised portions or projections act to localise the heat of the welding circuit.

Bond Pair	Lone Pair	Shape
2	1	Bent
2	2	Bent
3	1	Trigonal Pyramidal
3	2	T-Shape
4	1	See Saw
4	2	Square Planner
5	1	Square Pyramidal
5	2	

749. In fusion welding, porosity defect is due to
a- Porosity results when the gases are entrapped in the solidifying weld metal

750.
The value of stress concentration factor depends upon
a-material and geometry of the part

751.
Stress concentration is caused due to
a- abrupt change of cross-section
752.



The uniform pole has a mass of 15 kg and falls from rest when $\theta = 90^\circ$ until it strikes the edge at A, $\theta = 60^\circ$. If the pole then begins to pivot about this point after contact, determine the pole's angular velocity just after the impact. Assume that the pole does not slip at B as it falls until it strikes A.

The uniform pole has a mass of 15 kg and falls from rest when $\theta = 90^\circ$ until it strikes the edge at A, $\theta = 60^\circ$. If the pole then begins to pivot about this point after contact, determine the pole's angular velocity just after the impact. Assume that the pole does not slip at B as it falls until it strikes A.

Your Answer: $\omega_3 = 1.528 \text{ rad/s}$

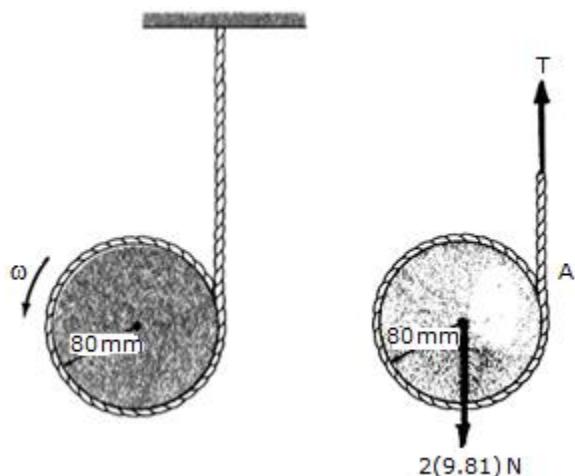
753.

Adding 'C' to pure Fe will
a-tensile strength and brittleness increases

754.

In water jet machining, the water jet is issued through a 0.3mm diameter orifice at a pressure of 400 MPa. The density of water is 1000 kg/cubic meter. The coefficient of discharge is 1.0. Neglecting all losses during water jet formation through the orifice, the power of the water in kW is _____

755.



A cord of negligible mass is wrapped around the outer surface of the 2-kg disk. If the disk is released from rest, determine its angular velocity in 3 s.

A cord of negligible mass is wrapped around the outer surface of the 2-kg disk. If the disk is released from rest, determine its angular velocity in 3 s.

Your Answer:

Correct Answer: $\omega = 245 \text{ rad/s}$

756.

Two identical pipes of length L , diameter D and friction factor f , are connected in parallel between two reservoirs. The size of a pipe of length L and of the same friction factor f , equivalent to the above pipes, is

a- 2D

757.

When a machine member is subjected to torsion, the torsional shear stress set up in the member is
a- maximum at both the centroidal axis and outer surface of the member

758.

Which of the following is the hardest one?

759.

What is the major driving force for any phase transformation?
ans-gibbs free energy

760.

The strain energy stored in a spring, when subjected to maximum load, without suffering permanent distortion, is known as

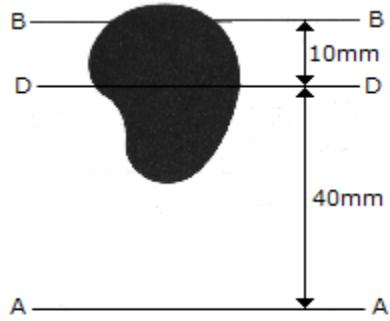
A- proof resilience

761.

When all the conditions are identical, in the case of flow through pipes with heat transfer, the velocity profiles will be identical for:

ans- The velocity profile for flow through pipes with heat transfer is identical for liquid heating and liquid cooling.

762.

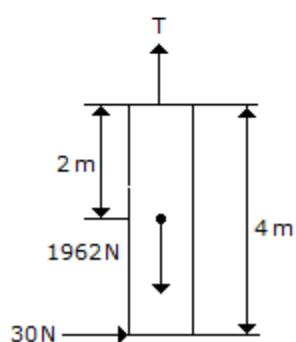
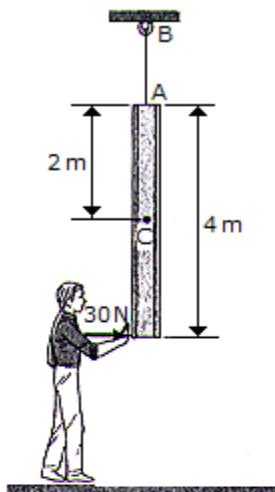


The irregular area has a moment of inertia about the AA axis of 35 (106) mm⁴. If the total area is 12.0(103) mm², determine the moment of inertia if the area about the BB axis. The DD axis passes through the centroid C of the area.

763.

A rod of length L having uniform cross-sectional area A is subjected to a tensile force P. If the Young's modulus of the material varies linearly from E₁ to E₂ (Given that; E₁>E₂) along the length of the rod, the normal stress developed at the mid section of the beam is

764.



The slender 200-kg beam is suspended by a cable at its end as shown. If a man pushes on its other end with a horizontal force of 30 N, determine the initial acceleration of its mass center G, the beam's angular acceleration, and the tension in the cable AB.

765.

Minor losses in a pipe flow are those losses
 A- losses due to entries and exits, fittings and valves are traditionally referred to as minor losses.
 These losses represent additional energy dissipation in the flow, usually caused by secondary flows induced by curvature or

recirculation. The minor losses are any head loss present *in addition to the head loss for the same length of straight pipe.*

766.

Which of the following are intensive properties

- chemical potential, μ
- color^[6]
- concentration, c
- density, ρ (or specific gravity)
- magnetic permeability, μ
- melting point and boiling point^[7]
- molality, m or b
- pressure, p
- specific heat capacity, c_p
- specific volume, v
- standard reduction potential,^[7] E°
- temperature, T
- thermal conductivity

767.

The bending stress in a beam is _____ section modulus.

A- inversely proportional to

768.

Voltage during the arc-striking compared to the voltage during welding in electric arc welding is
ans-more

769.

Two pipelines of equal length and diameter of 20 cm and 30 cm respectively are connected in parallel between two reservoirs. If the friction factor f is the same

for both the pipes, the ratio of the discharges in the smaller to the larger size of the pipe is
ans -ask varma

770.

The radial distance of a tooth from pitch circle to the bottom of the tooth is called

A- addendum

771.

Bernoulli equation is applicable between any two points

A- The flow is steady, constant density and rotational

772.

The weld pool is surrounded by an inert gas in

ans-

are welding

- carbon arc
 - MIG
 - submerged arc
- in mein se koi hai

773.

The module is reciprocal of

A-DIAMETRICAL PITCH

774.

Two identical circular rods of same diameter and same length are subjected to same magnitude of axial tensile force. One of the rods is made out of mild steel having the modulus of elasticity of 206 GPa. The other rod is made out of cast iron having the modulus of elasticity of 100 GPa. Assume both the materials to be homogeneous and isotropic and the axial force causes the same amount of uniform stress in both the rods. The stresses developed are within the proportional limit of

the respective materials. Which of the following observations is correct?

775.

Filler metal is used in
A-WELDING

776.

In a sample of water an increase of pressure by 18 MN/m² caused 1% reduction in the volume. The bulk modulus of elasticity of this sample, in MN/m² is
ans-ask varma

777.

The condition for correct gearing is

A- “The common normal AB to the involutes at the point of contact Q (called the line of action) meets the line of centres O₁O₂ at the (fixed) pitch point P. this is the condition required for maintaining a constant angular velocity ratio and is known as the fundamental law of gearing”

778.

A perfect fluid (also known as an ideal fluid is)
ans- a **perfect fluid** is a fluid that can be completely characterized by its rest frame mass density ;
and *isotropic pressure* p.

779.

Electroslag welding is

A- **Electroslag welding** (ESW) is a highly productive, single pass **welding** process for thick (greater than 25 mm up to about 300 mm) materials in a vertical or close to vertical position. (ESW) is similar to **electrogas welding**, but the main difference is the arc starts in a different location.

780.

Typical example of a non-Newtonian fluid of pseudoplastic variety is

A-BLOOD

781.

Interference can be avoided in involute gears with 20 degree pressure angle by

A-

(i) Stronger tooth with higher load carrying capacity

(ii) Greater length of contact

782.

If the principal stresses in a plane stress problem, are 100MPa, and 40MPa, the magnitude of the maximum shear stress (in MPa) will be

A-In plane stress problem, maximum shear stress is given by:

$$\tau_{\max} = \sigma_1 - \sigma_2$$

$$\sigma_1 = 100 \text{ MPa}, \sigma_2 = 40 \text{ MPa}$$

$$\tau_{\max} = \sigma_1 - \sigma_2 = 100 - 40 = 30 \text{ MPa}$$

783.

In simple gear train, if the number of idle gears is odd, then the motion of driven gear will

A- be same as that of driving gear

784.

The fall velocity of a sand grain in water is to be modelled by using particles of the same relative density as sand and a liquid whose kinematic viscosity is 100 times larger than that of water. The diameters of the

particles in the model that will have the same fall velocity as the prototype will be
785.

Which of these factors doesn't affect the stress of a wire?

A-ORIGINAL LENGTH

789.

The potential function exist for

790.

Filler material is essentially used in

A-SEAM WELDING

791.

Grey iron is generally welded by

A-GAS WELDING

792.

Which of the following is not a basic type of strain?

A- Area strain

793.

Given that W_m = weight of the molten metal displaced by a core and W_c = weight of the core, the buoyancy force is which one of the following?

ans-upward force = $W_m - W_c$?

794.

In a gear train, when the axes of the shafts, over which the gears are mounted, move relative to a fixed axis is called

A-EPICYCLIC GEAR TRAIN

795.

The centre of buoyancy of a submerged body
ans- The **buoyant** force on a **submerged** or floating **body** is equal to the weight of liquid displaced by the **body** and acts vertically upward through the centroid of displaced volume known as **centre of buoyancy**.

796.

Which bearing is best for space constraint?

ans-journal

797.

Copper is

ans- **Copper is** a chemical element with symbol Cu (from Latin: cuprum) and atomic number 29. It is a soft, malleable, and ductile metal with very high thermal and electrical conductivity. A freshly exposed surface of pure **copper** has a reddish-orange color.

798.

A differential gear in automobile is used to

A-Differential is used to differentiate torque between wheels.

799.

A triangular gate with a base width of 2m and a height of 1.5 m lies in a vertical plane. The top vertex of the gate is 1.5m below the surface of a tank which contains oil of specific gravity 0.8. Considering the density of water and acceleration due to gravity to be 1000 kg/cu.m and 9.81 m/s² respectively, the hydrostatic force (in KN) exerted by the oil on the gate is 800.

In electrical resistance welding

a- produce coalescence of faying surfaces where heat to form the weld is generated by the electrical resistance of material combined with the time and the force used to hold the materials together during welding

801.

A thin cylinder of inner radius 500mm and thickness 10mm is subjected to an internal pressure of 5MPa. The average circumferential (hoop) stress in MPa is

$$A- \sigma_H = Pd/2t = 250 \text{ MPa}$$

802.

An example of plastic welding is

- 1.1 Hot gas welding
 - 1.1.1 Welding rod
 - 1.1.2 Heat sealing
 - 1.1.3 Freehand welding
- 1.2 Speed tip welding
- 1.3 Extrusion welding
- 1.4 Contact welding
- 1.5 Hot plate welding
- 1.6 High frequency welding
- 1.7 Induction welding
- 1.8 Injection welding
- 1.9 Ultrasonic welding
- 1.10 Friction welding
- 1.11 Spin welding
- 1.12 Laser welding
- 1.13 Solvent welding

803.

A disk clutch is required to transmit 5 kW at 2000 rpm. The disk has a friction lining with coefficient of friction equal to 0.25. Bore radius of friction lining is equal to 25 mm. Assume

uniform contact pressure of 1 MPa. The value of outside radius of the friction lining is

A-According to uniform pressure theory,

$$P = 1 \text{ MPa}$$

Power transmitted, $P=T\omega=T\times2\pi N 60$
 $T=60\times5\times1032\pi\times2000=23.87 \text{ Nm}$ $T=23\times\mu p\pi(r_{31}-r_{32})\Rightarrow23.81\times103=23\times0.25\times1\times(r_{31}-253)\times\pi$ $T=60\times5\times1032\pi\times2000=23.87 \text{ Nm}$ $T=23\times\mu p\pi(r_{13}-r_{23})\Rightarrow23.81\times103=23\times0.25\times1\times(r_{13}-253)\times\pi$
 $\therefore r_1 = 39.4 \text{ mm}$

804.

Consider the following statements:

1. If a condensing liquid does not wet a surface drop wise, then condensation will take place on it.
2. Drop wise condensation gives a higher heat transfer rate than filmwise condensation.
3. Reynolds number of condensing liquid is based on its mass flow rate.
4. Suitable coating or vapour additive is used to promote film-wise condensation.

Of these statements:

A-1,2,AND 3 CORRECT

805.

The angle between the direction of the follower motion and a normal to the pitch curve is called

A- Pressure Angle

806.

When shear force at a point is zero, then bending moment is _____ at that point.

A- maximum

807.

The following is not included in title block of drawing sheet.

a. A- Size of sheet

b.

808.

In sintering stage of powder metallurgy, which of the following process take place?

ans- Sinter hardening

Liquid Phase Sintering

- Transient liquid phase sintering
- Permanent liquid phase sintering

Rearrangement

Solution-precipitation

Final densification

809.

The friction factor f in a laminar pipe flow was found to be 0.04. The Reynolds number of the flow was

810.

In production of precision components, the use of powder metallurgy technique mainly reduces

ans- a. Material cost b. Machining cost

c. Equipment cost d. None of the above

in mein se kuch

811.

The Reynolds number for the flow of oil in a certain pipe is 640. The Darcy-Weisbach friction factor f for the flow is

- (a) 0.02
- (b) 0.01
- (c) 0.1
- (d) 0.064

in mein se kuch

812.

Which of the following represent reducing scale?

A-1:2

813.

A clutch has outer and inner diameters 100 mm and 40 mm respectively.

Assuming a uniform pressure of 2MPa and coefficient of friction of liner

material is 0.4, the torque carrying capacity of the clutch is

$$A - T = 23\mu W(R_3 - r_3 R_2 - r_2) T = 23\mu W(R_3 - r_3 R_2 - r_2)$$

$$T = 23\pi\mu(R_3 - r_3)[W\pi(R_2 - r_2)] T = 23\pi\mu(R_3 - r_3)[W\pi(R_2 - r_2)]$$

$$T = 23\pi\mu p(R_3 - r_3) = 23 \times 3.14 \times 0.4 \times 2[(100^2)3 - (40^2)3] T = 23\pi\mu p$$

$$(R_3 - r_3) = 23 \times 3.14 \times 0.4 \times 2[(100^2)3 - (40^2)3]$$

$$= 23 \times 3.14 \times 0.4 \times 2 \times (503 - 203) = 196035.38 \text{ Nmm} = 196.035 \text{ Nm} =$$

$$23 \times 3.14 \times 0.4 \times 2 \times (503 - 203) = 196035.38 \text{ Nmm} = 196.035 \text{ N}$$

m

$\approx 196 \text{ Nm}$

814.

Widely used metal powder production method for powder metallurgy is

A- Electrolysis OR Electrolytic deposition

815.

The clutch used in scooter is

A- MULTIPLATE FRICTION CLUTCH

816.

In first angle projection method, object is assumed to be placed in

A- first quadrant

817.

In a turbulent flow through a pipe the centreline velocity is 3.61 m/s and the friction factor $f=0.002$. The mean velocity of the flow in m/s is

ans- vinayak se puchho

818.

Match List-I with List-II and select the correct answer using the codes given below the lists: List-I List-II

- | | |
|---------------------------------|------------------|
| A. Single-plate friction clutch | 1. Scooters |
| B. Multi-plate friction clutch | 2. Rolling mills |
| C. Centrifugal clutch | 3. Trucks |
| D. Jaw clutch | 4. Mopeds |

ANSWER- 1-B,2-C,3-A,4-D

819.

One of the process used to manufacture crankshafts is

1. Forging
2. Casting
3. Machining

820.

In a steady flow

A- a **flow** in which the velocity of the fluid at a particular fixed point does not change with time — called also stationary **flow**; compare uniform **flow**.

821.

Metric thread of 10mm diameter is represented by

822.

This is the term for the range of tightness or looseness resulting from the allowances and tolerances in mating parts

A- Fit

823.

If B =centre of buoyancy, G =is the centre of gravity and M =metacentre of a floating body, the body will be in stable equilibrium if

- (a) $MG = 0$
- (b) M is below G
- (c) $BG = 0$
- (d) M is above G

in mein se kuch

824.

Most suitable process for manufacturing carburettor body is

825.

The commonly used angle between leather or asbestos friction lining surface and axis of cone clutch for a cone clutch is

- (a) 14.5°
- (b) 20°
- (c) 12.5°
- (d) 45°

in mein se koi

826.

In a radial cam, the follower moves

A-in a direction perpendicular to the cam axis

827.

In a band brake the ratio of tight side band tension to the tension on the

slack side is 3. If the angle of overlap of band on the drum is 180° , the

coefficient of friction required between drum and the band is

A-0.35

828.

Most suitable process for manufacturing nails is

ans - forming

829.

The head loss in 100m length of a 0.1m diameter pipe ($f=0.02$) carrying water is 10m. The boundary shear stress, in kPa, is

830.

In block brakes, the ratio of shoe width and drum diameter is kept between

A- 0.25 and 0.50

831.

This means that a feature of a finished product contains the maximum amount of material permitted by the toleranced dimensions for that feature:

A- Maximum material condition

832.

A circular pipe has a diameter of 1m, bed slope of 1 in 1000, and Manning's roughness coefficient equal to 0.01. It may be treated as an open channel flow when it is flowing just full, i.e., the water level just touches the crest. The discharge in this condition is denoted by $Q(\text{full})$. Similarly, the discharge when the pipe is flowing half-full, i.e. with a flow depth of 0.5m, is denoted by $Q(\text{half})$. The ratio of $Q(\text{full})/ Q(\text{half})$

ans- 2

833.

Extrusion process can effectively reduce the cost of production through

ans- Process time saving

834.

In a hydraulic jump occurring in a horizontal rectangular channel the sequent depths are 0.25m and 1.25m. The energy loss in this jump is

- (a) 0.8 m
- (b) 1.0 m
- (c) 1.25 m
- (d) 1.50 m

in mein se koi

835.

A radial follower is one

A- The '**radial cam**' is a rotating plate or disc with an outer circumference shaped to produce a required movement (usually linear) to a 'follower' which is held against it.

836.

Major problem in hot extrusion is

A-DESIGN OF DIE

837.

Fabric belts are used in industrial applications because

ans-

838.

In a two-dimensional, steady, horizontal, uniform laminar flow the shear gradient in the normal direction is equal to

- (a) the velocity gradient in the normal direction.
- (b) the velocity gradient in the longitudinal direction
- (c) the pressure gradient in the normal direction.
- (d) the pressure gradient in the direction of flow.

in mein se koi

839.

This is the theoretically exact size from which limits of size are determined:

A-DIMENSIONAL SIZE

840.

The power transmitted by the belt drive can be increased by

A- When the power transmitted is maximum, 1/3rd of the maximum tension is absorbed as centrifugal tension.

$$T = 3T_C$$

where T_C = Centrifugal tension

841.

Upsetting or cold heading is a

A- Cold Heading is a process where a length of wire is cut off of a coil and then placed into a die. A hammer will then either UPSET the material (Place a head on it) or EXTRUDE the material (force the wire into a smaller die).

842.

offset is provided to a cam follower mechanism to

A- minimize the side thrust

843.

In hydraulic modelling of flow pattern around a body submerged in a fluid the non-dimensional number which has to be kept the same in the model and prototype is

- (a) Weber number
- (b) Froude number
- (c) Reynolds number
- (d) Strouhal number

in mein se koi

844.

In a 6×20 wire rope, No.6 indicates the

A-NO. OF STRANDS

845.

Material good for extrusion is

ans- lead, tin, aluminum, copper, zirconium, titanium, molybdenum, beryllium, vanadium, niobium, and steel.

846.

Seam less tube can be produced by

A- **Seamless tube** is extruded and drawn from a billet while **welded tube** is produced from a strip that is roll

formed and welded to produce a **tube**. ...

Most **tubing(seamless)** and welded) is drawn to produce final dimensional tolerances. Drawing is an operation, which “pulls” a **tube** through a die.

847.

Which of the following is a dimensionless number:

848.

In a flat belt drive the belt can be subjected to a maximum tension T and centrifugal tension T_c . What is the condition for transmission of maximum power?

849.

Acceptable parts must not extend beyond this:

A- Boundary limits



850.

Interference between the teeth of two meshing involute gears can be reduced or eliminated by

1. Increasing the addendum of the gear teeth and correspondingly reducing the addendum of the pinion.
2. Reducing the pressure angle of the teeth of the meshing gears.
3. Increasing the centre distance

Which of the statements given above is/are correct?

A-BOTH 1 AND 2

851.

This practice considers an individual part's dimensions and tolerances and that part's relation to its related parts:

A-Geometric dimensioning and tolerancing



852.

The drag force on a body

a- The drag force acts in a direction that is opposite of the relative flow velocity. – Affected by cross-section area (form drag) – Affected by surface smoothness (surface drag)
853.

A tooth paste tube can be produced by
a- hollow backward extrusion
854.

These weld symbols have no arrow-side or other-side significance:

a- Flash and upset weld
855.

Rolling process can not be used to produce
856.

Match List-I with List-II and select the correct answer using the codes given below the lists: List-I List-II

- | | |
|-------------------|--------------------------|
| A. Undercutting | 1. Beam strength |
| B. Addendum | 2. Interference |
| C. Lewis equation | 3. Large speed reduction |
| D. Worm and wheel | 4. Intersecting axes |
| | 5. Module |

857.

The lift force on a body

a- The **lift force**, **lifting force** or simply **lift** is the sum of all the forces on a body that force it to move perpendicular to the direction of flow.it is a vector quantity

858.

The dynamic load capacity of 6306 bearing is 22 kN. The maximum radial load it can sustain to operate at 600 rev/min, for 2000 hours is

a-5.29 KN

859.

The discharge Q in a pipe of know f is estimated by using the head loss hf in a length L and diameter D . If an error of 1% is involved in the measurement of D , the corresponding error in the estimation of Q is
a-2.5%

860.

Welding drawings are a special type of this kind of drawing:

a- Assembly

861.

For a low and moderate speed engines, the cam follower should move with

a-simple harmonic motion

862.

The linear momentum equation applied to a control volume in a flow through a nozzle yielded the resultant reaction force R , on the fluid in the control volume. The force required to keep the nozzle in position is

- (a) R in magnitude and in its direction.
- (b) equal to R but opposite in direction.
- (c) equal to x component of R .
- (d) equal to x component minus the friction force.

inmein se koi

863.

In sliding contact bearings, a positive pressure can be built up and a load supported by a fluid only by the use of a:

a-converging films

864.

Assertion (A): In hydrodynamic journal bearings, the rotating journal is held in floating condition by the hydrodynamic

pressure developed in the lubricant. Reason (R): Lubricant flows in a converging-diverging channel.

a- Both A and R are true and R provides correct explanation for A

865.

The typical parts list should include the _____

- A.** part number
- B.** manufacturing material
- C.** number of parts needed
- D.** all of the above

ans= D

866.

Hydraulic grade line for flow in a pipe of constant diameter is

867.

For high speed engines, the cam and follower should move with

a- cycloidal motion

868.

For a single stage impulse turbine with a rotor diameter of 2 m and a speed of 3000 rpm when the nozzle angle is 20° , the optimum velocity of steam in m/s is

KHUD KRO

869.

For steady incompressible flow through a closed-conduit of uniform cross-section, the direction of flow will always be,

ANSWER: From higher to piezometric board
870.

A typical set of mechanical working drawings includes

-
- [A]. exploded assembly
 - [B]. part details
 - [C]. parts list
 - [D]. all of the above

Answer: Option D

871.

The title block used on working drawings should include the _____

- A. sheet number
- B. line type
- C. layer set
- D. all of the above

Answer: Option A

872.

A circular pipe has a diameter of 1m, bed slope of 1in 1000, and Manning's roughness coefficient equal to 0.01. It may be treated as an open channel flow when it is flowing just full, i.e., the water level just touches the crest. The discharge in this condition is denoted by $Q(\text{full})$. Similarly, the discharge when the pipe is flowing half-full, i.e. with a flow depth of 0.5m, is denoted by $Q(\text{half})$. The ratio of $Q(\text{full})/Q(\text{half})$
ans- 2

873.

The text used on a typical detail sheet should be
ans-in bold text

874.

A pipe of 0.7m diameter has a length of 6 km and connects two reservoirs A and B. The water level in reservoir A is at an elevation 30m above the water level in reservoir B. Halfway along the pipe line. There is a branch through which water can be supplied to a third reservoir C. The friction factor of the pipe is 0.024. The quantity of water discharged into reservoir C is 0.15 cumecs. Considering the acceleration due to gravity as 9.81 m/s² and neglecting minor losses, the discharge (in cumes) in to the reservoir B is,

ans- 0.56 to 0.58

875.

In an exploded assembly drawing it is customary for the drafter to use a _____ line to illustrate how parts fit together.

- A. Phantom
- B. Hidden
- C. Dashed
- D. Center

Answer: Option A

876.

A perfect fluid (also known as an ideal fluid is),
ans- **perfect fluid** is a fluid that can be completely
characterized by its rest frame mass density ;
and isotropic pressure p.

877.

When a shear stress is applied to a substance it is found to resist it by elastic deformation. The substance is
ans-solid

878.

which of the following displacement diagrams should be chosen for better dynamic performance of cam follower motion

ans- cycloidal motion

879.

The viscosity of

880.

It is customary for the first sheet of a working drawing set to include _____

- A. a parts list
- B. exploded assembly
- C. assembled assembly
- D. all of the above

Answer: Option D

881.

A real fluids is any fluid which
ans-Fluid that have viscosity($\mu > 0$) and their motion known as viscous flow.

882.

The thread note for a typical bolt will include the _____

Ans- major diameter of the thread

883.

Typical example of a non-Newtonian fluid of pseudo plastic variety is

ans- blood

884.

A combination of kinematic pairs, joined in such a way that the relative motion between the linkage is completely constrained is called as

ans- kinematic chain

885.

The mechanism forms a structure, when the number of degree of freedom is equal to

ans- 0

886.

In a sample of water an increase of pressure by 18 MN/m² caused 1% reduction in the volume. The bulk modulus of elasticity of this sample, in MN/m² is

- (a) 1.80
(c) 1800

- (b) 180
(d) 0.18

in mein se koi hai

887.

In a four bar chain or quadric cycle

The simplest and the basic kinematic chain is a four bar chain or quadric cycle chain

888.

Broadly speaking, water is ,

ans- **Water** is a transparent and nearly colorless chemical substance that is the main constituent of Earth's streams, lakes, and oceans, and the fluids of most living organisms. Its chemical formula is H₂O, meaning that its molecule contains one oxygen and two hydrogen atoms that are connected by covalent bonds.

889.

If a capillary rise of water in a 2mm diameter tube is 1.5cm, the height of capillary rise in a 0.5mm diameter tube, in cm, will be

ans- 6

890.

This is a conical-shaped recess around a hole, often used to receive a tapered screw head:

ans-countersink

891.

If the surface tension of water-air interface is 0.073 N/m, the gauge pressure inside a rain drop of 1mm diameter is

- (a) 0.146 N/m²
- (b) 73 N/m²
- (c) 146 N/m²
- (d) 292 N/m²

- Answer

Option (d) is correct

Pressure is given as

$$= \frac{4\sigma}{D}$$

σ =Surface tension

892.

This is an angled surface used on cylinders to make them easier to handle:

ans- Chamfer

893.

The excess pressure (above atmospheric) inside a soap bubble of diameter 1cm, by assuming the surface tension of soap solution to be 0.04 N/m, is

ans- 20 Pa.

894.

These are used to attach parts to a cylinder so they won't turn on it:

ans- Keys and keyways/keyseats

895.

This is a flat or rounded tab protruding from a surface, usually to provide a method for attachment:

ans- Lug

896.

The capillary rise in a 3 mm tube immersed in a liquid is 15 mm. If another tube of diameter 4mm is immersed in the same liquid the capillary rise would be

897.

At a liquid-air-solid interface the contact angle measured in the liquid is less than 90 degree. The liquid is,

898.

This is a hollow cylinder that is often used as a protective sleeve or guide or as a bearing:

ans- Bushing

899.

At 20 deg. Centigrade, pure water will have a vapour pressure, in kPa, of about

ans- 2.33kpa

900.

This is a rounded exterior blend between surfaces:

ans- rounded

901.

The total number of instantaneous centres for a mechanism consisting of n links are

ans- $n(n - 1)/2$

901.

- 1) The total number instantaneous centers for a mechanism consisting of ' n ' links are
- A) $n/2$
 - B) n
 - C) $(n-1)/2$
 - D) $n(n-1)/2$

[View Answer](#)

Answer : $n(n-1)/2$

902. At 100 deg. Centigrade, at sea level, pure water will have a vapour pressure, in kPa, of about,

Answer – 101.325 Kpa

903. For a fluid at rest,

904.

The instantaneous centres which vary with the configuration of mechanism, are called

- A.** permanent instantaneous centres
- B.** fixed instantaneous centres

- C. neither fixed nor permanent instantaneous centres
- D. none of the above

Answer: Option C

905.

The two parallel and coplanar shafts are connected by gears having teeth parallel to the axis of the shaft. This arrangement-

- a) spur gearing
- b) helical gearing
- c) bevel gearing
- d) spiral gearing

Answer – Spur Gearing

906. The normal stress is the same in all directions at a point in a fluid

- (a) only when the fluid is frictionless
- (b) only when the fluid is frictionless and incompressible
- (c) only when the fluid is incompressible
- (d) when the fluid is at rest, regardless of its nature [Ans.(d)]

907. An imaginary circle which by pure rolling action gives the same motion as the actual gear, is called

- [A]. addendum circle
- [B]. dedendum circle
- [C]. pitch circle ✓
- [D]. clearance circle

Answer: Option C

908. Local atmospheric pressure is measured by

- A) a Bourdon gauge
- B) a memory Barometer
- C) a manometer
- D) a hot-wire anemometer

[View Answer](#)

Answer : a memory Barometer

909. Which of the following statement is correct for gears?

- [A]. The addendum is less than dedendum
- [B]. The pitch circle diameter is equal to the product of module and number of teeth
- [C]. The pitch circle is always greater than the base circle
- [D]. all of the above ✓

Answer: Option D

910. Identify the correct statement

911. Cam size depends upon

- [A]. Cam operating speed
- [B]. Pitch circle
- [C]. Base circle
- [D]. Prime circle
- [E]. Outer circle

Answer: Option C

**911. Bourdon gauge measures – Answer: Gauge Pressure
(Absolute pressure – Atmospheric pressure)**

912. When the barometer reads 740.00mm of mercury, a pressure of 10kPa suction at that location is equivalent to

- a) 10.02 m of water (abs)
- b) 9.87 m of water (abs)
- c) 88.53 kPa (abs) - ANSWER
- d) 0.043 kPa (abs)

913. In case of a cam, the maximum value of the pressure angle is kept as

- a) 30°
- b) 20°
- c) 15°
- d) 45°

ANSWER: a) 30°

914.

The standard atmospheric pressure is 760 mm of mercury. At a certain location the barometer reads 700 mm of mercury. At this place an absolute pressure of 380mm of mercury corresponds to a gauge pressure, in mm of mercury

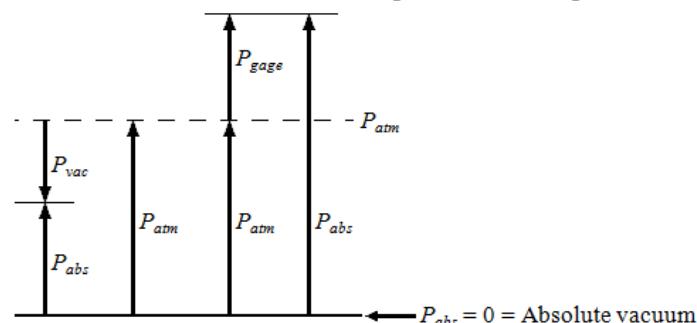
- (a) 320 mm of Hg vacuum
- (b) 382 of Hg vacuum
- (c) 62 mm of Hg vacuum
- (d) 62 mm of Hg gauge

— Answer

Option (a) is correct

Note: Atmospheric pressure of that specific place is always taken as reference

$$\text{Pressure} = 380 - 700 = -320 \text{ mm of Hg} = 320 \text{ mm of Hg vacuum}$$



916.

Consider the following pairs

1. pair of gear in mesh
2. belt and pulley
3. cylinder and piston
4. cam and follower

Among these, the higher pairs are- ANSWER: **OPTION**

1,2,4

917. A cam mechanism imparts following motion

- A. rotating
- B. oscillating

- C. reciprocating
- D. all of the above
- E. none of the above **ANSWER – D**

918.

A barometer at a given location -

919.

A U-tube manometer measures, (**ANSWER - u-tube manometer used to measure** pressure difference in pitot or orifices located in the airflow in air handling or ventilation system.)

920.

The contact ratio for gear is

- a) zero
- b) less than one
- c) greater than one
- d) none of the mentioned

[View Answer](#)

Answer: **C**

Explanation: The theoretical minimum value for the contact ratio is one, that is there must always be at least one pair of teeth in contact for continuous action. It can be defined as a measure of the average number of teeth in **contact** during the period during which a tooth comes and goes out of **contact** with the mating **gear**. **The contact ratio** in a transverse plane. It is the **ratio** of the angle of action to the angular pitch.

921.

A U-tube open at both ends and made of 8mm diameter glass tube has mercury in the bottom to a height of 10 cm above the horizontal limb. If 19 cc of water is added to one the limbs, the difference in mercury levels at equilibrium is

922. Module of a gear is (T- number of teeth; D- Diameter of the gear) – **ANSWER: D/T**

923. The gears used to connect non-parallel and non-intersecting shafts is

- a. Straight bevel gears
- b. Spiral bevel gears
- c. Spiral gears
- d. Double helical gears

(Ans:c)

924.

A cylindrical tank of 2m diameter is laid with its axis horizontal and is filled with water just to its top. The force on one of its end plates is kN, is

925.

The centre of buoyancy of a submerged body – **Lies on the Centre of Geometry**

926.

Angular acceleration of a link can be determined by dividing the

- A. centripetal component of acceleration with length of link
- B. tangential component of acceleration with length of link
(ANSWER)
- C. resultant acceleration with length of link
- D. all of the above
- E. none of the above.

927.

An object weighing 100N in air was found to weigh 75 N when fully submerged in water. The relative density of the object is (SOLUTION – Buoyant force = 100-75 = 25N = $P_w \cdot g \cdot V_o$. $P_o = M_o/V_o$. $M_o = 100/10$ kg, => $P_o = 4000$ kg/m³. Relative density = 4000/1000 = **4**)

928.

The Kutzbach criterion for determining the number of degrees of freedom (n) is (where l = number of links, j = number of joints and h = number of higher pairs)

- | | |
|----------------------|----------------------|
| a. $n = 3(l-1)-2j-h$ | b. $n = 2(l-1)-2j-h$ |
| c. $n = 3(l-1)-3j-h$ | d. $n = 2(l-1)-3j-h$ |

(Ans:a)

929.

A point on a link connecting a double slider crank chain will trace a

- A) straight line
- B) circle
- C) parabola
- D) ellipse

Correct Answer : ellipse

930.

An iceberg has 12% of its volume projecting above the surface of the sea. If the density of sea water is 1025 kg/cu.m, the density of the iceberg is (Explanation – $P_i \cdot g \cdot V_i = P_w \cdot g \cdot (0.88V_i)$; find $P_i = 902 \text{ kg/cu.m}$)

931.

A metal block is thrown into a deep lake. As it sinks deeper in water, the buoyant force acting on it

- a) increases
 - b) decreases
 - c) remains same
 - d) first increases then decreases.
- ANSWER: (c) remains same**

932.

The coriolis component of acceleration leads the sliding velocity by

- [A]. 45°
- [B]. 90°
- [C]. 135°
- [D]. 180°

Answer: Option B

933.

Which gear train is used for higher velocity ratios in a small space?

- a) Simple gear train
- b) Compound gear train
- c) Reverted gear train
- d) Epicyclical gear train

[View Answer](#)

Answer: d

Explanation: The epicyclic gear trains are useful for transmitting high velocity ratios with gears of moderate size in a comparatively lesser space. The epicyclic gear trains are used in the back gear of lathe, differential gears of the automobiles, hoists, pulley blocks, wrist watches etc.

934.

When a block of ice floating on water in a container melts, the level of water in the container (**ANSWER : DECREASES**)

935.

As a ship enters into a river from sea, one can expect that

It rises a little

*It sinks a little (**ANSWER**)*

It remains at the same level

Its level depends on the material used for construction

936.

In ideal machines, mechanical advantage is _____ velocity ratio.

A. equal to

B. less than

C. greater than

Answer: Option A

937.

Buoyant force is the (DEFINITION - The **buoyant force** comes from the pressure exerted on the object by the fluid. Because the pressure increases as the depth increases, the pressure on the bottom of an object is always larger than the **force** on the top - hence the net upward **force**. The **buoyant force** is present whether the object floats or sinks.)

938.

In order to draw the acceleration diagram, it is necessary to determine the Coriolis' component of acceleration in the case of

[IES-1997]

- (a) crank and slotted lever quick return mechanism
- (b) slider-crank mechanism
- (c) four bar mechanism
- (d) pantograph.

Ans. (a)

939.

If B=centre of buoyancy, G=is the centre of gravity and M=metacentre of a floating body, the body will be in stable equilibrium if

- a) $MG=0$
- b) M is below G
above G (**ANSWER**)
- c) $BG=0$ d) M is

**GM > 0 (M is above G)
equilibrium - (ANSWER)**

Stable

GM = 0 (M coinciding with G)

Neutral

equilibrium

GM < 0 (M is below G)

Unstable equilibrium

940.

Which of the gear train is used for higher velocity ratios in small space?

- a) Simple gear train
- b) Compound gear train
- c) Reverted gear train
- d) Epicyclic gear train

[View Answer](#)

Answer:d

Explanation: The epicyclic gear trains are useful for transmitting high velocity ratios with gears of moderate size in a comparatively lesser space. The epicyclic gear trains are used in the back gear of lathe, differential gears of the automobiles, hoists, pulley blocks, wrist watches etc.

941.

A liquid undergoing a rigid body rotation in a container is said to have

- | | |
|-------------------------|----------------|
| A) Forced vortex motion | B) Circulation |
| C) Free vortex motion | D) Translation |

[View Answer](#)

Answer : Forced vortex motion

942.

A term used to describe the concept of perfect form at MMC is

- A)the envelope principle (**ANSWER**)
- B)Datum reference frame
- C) Departure from MMC
- D) Rule#1

943.

Which of the following is descriptive of the datum reference frame?

- A)located based on the functionality of the part
- B)six degrees of freedom
- C) all of the above (**ANSWER**)
- D) three orthogonal planes

944.

. The flow of liquid at constant rate in a conically tapered pipe is classified as

- a. Steady, uniform flow
- b. Steady , non uniform flow
- c. unsteady, uniform flow
- d. unsteady , non uniform flow (**Ans: b**)

945.

A vast majority of functional gages are made to check
_____ tolerances

- A)position (**ANSWER**)
- B)Runout
- C) Circularity
- D) Flatness

946.

A pathline is the [DEFINITION: **Pathline** is the line traced by a given particle. This is generated by injecting a dye into the fluid and following its path by photography or other means]

947.

A streamline is a line [DEFINITION : A **streamline** is a **line** that is tangential to the instantaneous velocity direction (velocity is a vector, and it has a magnitude and a direction). To visualize this in a flow, we could imagine the motion of a small marked element of fluid.]

948.

The single most valuable, flexible, and versatile geometric control is

- A)Position (**ANSWER**)
- B)Concentricity
- C) Perpendicularity
- D) Straightness

949.

In a steady flow [Definition of **steady flow**. : a **flow** in which the velocity of the fluid at a particular fixed point

does not change with time — called also stationary **flow**.)

950.

In establishing datums and datum features the bottom surface of a part is called the _____ and the surface plate is called the _____.

- A) Datum, Datum feature
- B) datum feature, datum (**ANSWER**)
- C) datum control, datum feature
- D) none of the above

951.

In a rectangular channel 3m wide the depth of flow is 1.3m and the velocity is 1.6m/s. At a hydraulic structure 1.24 m³/s of discharge is withdrawn and the canal width is reduced to 2.5m. The depth of flow in this section at a velocity of 1.5 m/s is

- A) 1.21m
- B) 1m
- C) 1.33m
- D) 1.66m

952.

Maximum material condition (MMC) is the condition with which a part will

- A) Weigh the least
- B) weigh the most (**ANSWER**)

- C) have the straightest and flattest elements
- D) have its largest allowable tolerance

953.

For practical purposes, any inspection instrument will be considered as "perfect" if it is at least _____ more accurate than the part being measured.

- A) 5 times
- B) 10 times (**ANSWER**)
- C) 50 times
- D) 100 times

954.

A flow has diverging straight streamlines. If the flow is steady, the flow

- a. is a uniform flow with local acceleration
- b. has convective normal acceleration
- c. has convective tangential acceleration (**ANSWER**)
- d. has both convective normal and tangential accelerations

955.

A flow has parallel curved streamlines and is steady. This flow has

- a. is a uniform flow with local acceleration
- b. has convective normal acceleration (**ANSWER**)
- c. has convective tangential acceleration

d. has both convective normal and tangential accelerations

956.

The most useful secondary datum feature can be

- A)**a hole that is perpendicular to the primary datum (**ANSWER**)
- B)**a set of straight parallel grooves
- (C)** circular features parallel to the primary datum
- (D)** any flat feature perpendicular to the primary datum

957.

A velocity potential exists for -- irrotational flow

(Explanation - Curl of a gradient of a scalar function is Zero. Only if the Curl of the **velocity** vector is zero, there **exists** a scalar function (**Velocity potential** in our case). Curl of **velocity** vector equal to zero means the flow is irrotational. Hence, **Velocity potential exists** only for a irrotational flow.)

958.

The number of variables used in locating a part in space are referred to as (**X,Y,Z COORDINATE**)

959.

If a stream function exists it implies that, (**ANSWER – Continuity Equation exists and fluid is flowing**)

960.

All geometric form controls are variations and combinations of (**ANSWER - Straightness**. All form controls are variations and combinations of straightness. Straightness itself is based on a *line element*.)

961.

Indicate the incorrect statement:

A flow net _____

962.

Which symbol is used to indicate a dimension refers to the diameter of a hole? (**ANSWER – “Phi”**)

963.

Which symbol is used with angular dimensions?
(ANSWER – “DEGREE” SYMBOL)

964.

Bernoulli equation is applicable between any two points,

(a) The flow is steady, constant density and rotational (b) The flow is unsteady, constant density and irrotational (c) The flow is steady, variable density and rotational (d) The flow is steady, constant density and irrotational [Ans. (d)]

965.

In _____ dimensioning, a datum is established for each Cartesian coordinate direction.

- A)symmetric
- B)baseline (**ANSWER**)
- C) hole basis
- D) none of the above

966.

The piezometric head of a flow is

(**DEFINITION:** The sum of pressure head - p / γ - and elevation head - h - is called **the piezometric head**. The piezometric head in a flow can be measured through a flat opening parallel to the flow.)

967.

In current ANSI/ASME standards, a _____ is indicated by a 'V' shaped symbol

- a. counterbore
- b. datum surface
- c. countersink (**ANSWER**)
- d. drill

968.

In a flow of a real fluid with no addition of energy

969.

A limited length or area (such as a polished end of shaft) is indicated with a _____ line.

- a) hidden
- b) chain (**ANSWER**)
- c) dimension
- d) section

970.

The total head in a flow is the sum of

- **pressure head** - p / γ
- **velocity head** - $v^2 / 2 g$
- **elevation head** - h

971.

The difference between the total head line and the hydraulic grade line represents

ANSWER- Hydraulic Grade Line = $(p/\gamma) + h$; Total Head Line= $(p/\gamma) + (v^2/2g) + (h)$

Head Line – Hydraulic Grade Line = $v^2/2g$ = **Velocity Head.**

972.

As per standards, a blind hole dimension would have to contain which designation?

- a. DP (**ANSWER**)
- b. b. THRU
- c. c. C'BORE
- d. CSK

973.

In a pipeline the hydraulic grade line is above the pipe centre line is the longitudinal section at point A and below the pipe centre line at another point B. From this it can be inferred that

(For positive pressure in the pipe, the H.G.L. is above the centre line of pipe and for negative pressure in the pipe, H.G.L. is below the centre line of the pipe)

974.

As per standards, a clearance hole dimension would have to contain which designation?

975.

In a two-dimensional duct flow air flows in the bottom half of the duct with uniform velocity and there is no flow in the upper half. The value of the kinetic energy correction factor for this flow is

976.

The _____ of an external feature is the upper limit.

- A) maximum material condition
- B) runnout (**ANSWER**)
- C) minimum material condition
- D) allowance

977.

The _____ of an internal feature is the upper limit.

- A) maximum material condition
- B) runnout
- C) minimum material condition (**ANSWER**)
- D) allowance

978.

A 15 cm diameter pipe carries a flow of 70 lit/s of an oil (RD=0.75). At a section 62 cm above the datum the pressure is vacuum of 2 cm of mercury. If the kinetic energy correction factor for this section is 1.1, the total head at the section in meters of oil is

- a) 1.057
- b) 1.137
- c) 1.148
- d) 1.228

979.

A nozzle directs a liquid jet at an angle of elevation 45 deg. The hydraulic grade line for the jet

- a) Coincides with the centre line of the jet
- b) will be horizontal at the level of the jet
- c) Will be horizontal at the level of the energy line
- d) coincides with the energy line

980.

The total amount a dimension may vary and is the difference between the maximum and minimum limits is called _____

- a) Tolerance (**ANSWER**)
- b) limits
- c) fit
- d) offset

981.

A pump delivers 50 liters/s of water and delivers 7.5 kW of power to the system. The head developed by the pump is

- a) 7.5m
 - b) 5.0m
 - c) 1.53m
 - d) 15.32m
- (ANSWER)**

(Power = Pressure * Flow Rate ; Pressure = $p_w * g * h$; h = head)

982.

The type of fit that occurs when two toleranced mating parts are sometimes interference fit and sometimes a clearance fit when assembled.

- a) interference fit
- b) clearance fit
- c) transition fit**(ANSWER)**
- d)geometric fit

983.

The linear momentum equation is based on **(Newton's Second Law)**

984.

A titleblock contains all of the following information, except:

- a) Name and address of the company
- b) parts list **(ANSWER)**
- c) drawing sheet size letter designation
- d) drawing number

985.

An assembly drawing normally consists of all of the following pieces, except:

- a)parts drawn in their operating position
- b) detail numbers of the parts
- c)engineering change orders**(ANSWER)**
- d) bill of materials

986.

A control volume is

- [A]. A fixed region in space
- [B]. A specified mass
- [C]. An isolated system
- [D]. A reversible process only
- [E]. A closed system

Answer: Option **A**

987.

Which fastening method uses the shape of the components to hold them together?

- a) Mechanical fastening
- b) bonding
- c) forming(**ANSWER**)
- d) none of the above

988.

The line momentum equation is

989.

The linear momentum equation applied to a control volume in a flow through a nozzle yielded the resultant reaction force R, on the fluid in the control volume. The force required to keep the nozzle in position is

- (a) R in magnitude and in its direction (**probable answer**)
- (b) Equal to R but opposite in direction.
- (C) equal to x component of R. (D) equal to x component minus the friction force.

990.

What is the tool used to form external threads?

- A) crest B) die (**ANSWER**) C) chamfer D) tap

991.

A jet of oil ($R=0.8$) has an area of 0.02 sq.m and a velocity of 10 m/s. If it strikes a plate normally, the force exerted on the plate is (**EXPLANATION – Force = $pf * A * v^2$; $pf = 0.8 * 1000 = 800$; $v = 10$; $A=0.02$; R = Relative density / specific gravity**)

992.

What defines the distance a screw will travel when rotated 360 degrees?

- A) crest B) root C) pitch(**ANSWER**)
- D) lead

993.

All of the following are part of the English thread specification, except:

- A) thread form
- B) major diameter
- C) tap drill (**ANSWER**)
- D) class of fit

994.

A water jet has an area of 0.03 sq.m and impinges normally on a plate. If a force of 1 kN is produced as a result of this impact, the velocity of the jet, in m/s, is

(EXPLANATION – Force = $\rho f * A * v^2$)

995.

A water jet 0.015 sq.m in area has a velocity of 15 m/s. If this jet impinges normally on a plate which is moving at a velocity of 5 m/s in the direction of the jet, the force on the plate due to this impact is

(EXPLANATION – Force = $\rho f * A * v_{rel}^2 ; v_{rel} = 15-5 = 10 \text{ m/s.}$)

996.

All of the following are part of a metric thread specification, except:

- A) general purpose tolerance
- B) pitch
- C) nominal size
- D) thread series (**ANSWER**)

997.

A fire hose has a nozzle attached to it and the nozzle discharges a jet of water into the atmosphere at 20 m/s. This places the joint of the nozzle

- A) Tension (B) A state of zero stress (C) Compression
(ANSWER) (D) Bending stress

998.

Which type of threaded fastener was designed to prevent rotation between parts?

- A) Bolt B) set screw **(ANSWER)** C) stud
D) cap screw

999.

A two-dimensional jet strikes a fixed two-dimensional plane at 45 deg. To the normal to the plane. This causes the jet to split into two streams whose discharges are in the ratio

- a) 1.0 **(ANSWER)** b) 2.41 c) 5.83 d) 1.414

1000.

All of the following are part of the basic weld symbol, except:

- A) weld temperature **(ANSWER)** B) leader line and arrow C) dimensions D) tail

1001.

The velocity distribution over one half of a cross section is uniform and is zero over the remaining half. The momentum correction factor for this cross section is

- a) 2.0 **(ANSWER)** b) 4.0 c) 1.0 d) 3.0

1002.

When constructing an assembly model using 3-D solid modeling software, the assembly model normally begins with

- A) a feature
- B) an instance
- C) a sub component
- D) a base component (**ANSWER**)

1003.

Hydraulic grade line for flow in a pipe of constant diameter is

- a) Always above the centerline of the pipe
- b) always above the energy grade line
- c) Always sloping downwards in the direction of the flow(**ANSWER**)
- d) coincides with the pipe centerline

1004.

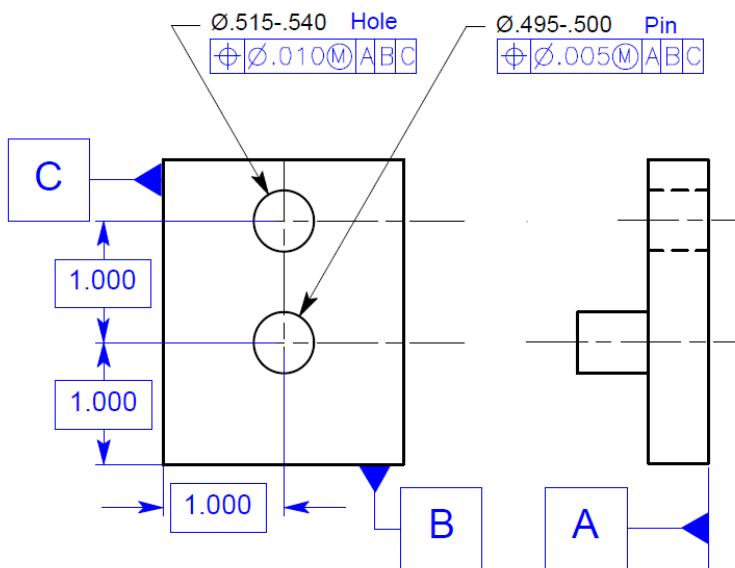
In solid modeling software, defining the geometric relations between components in a 3-D assembly model is primarily done with _____ and _____ tools.

- A) feature & coordinate plane
- B) mate & align(**ANSWER**)
- C) instance & component
- D) parallel & perpendicular

1005.

That is Maximum Material Condition for Hole _____ and Pin _____?

1005.



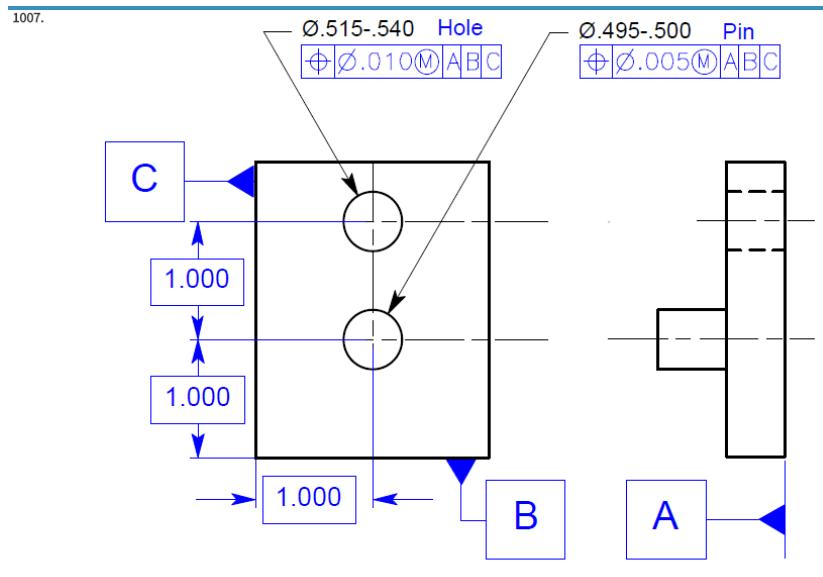
1006.

The minor loss due to sudden contraction is due to

- a) Flow contraction b. Expansion of flow after sudden contraction
- c. Boundary friction d. Cavitation

Ans: b

1007.



What is the LMC for Hole____ and Pin____?

1008.

Minor losses in a pipe flow are those losses

- a) Which are insignificantly small which can be neglected always
- b)
- c) Caused by local disturbance due to pipe fittings
- (ANSWER) d) caused by frictional resistance

1009.

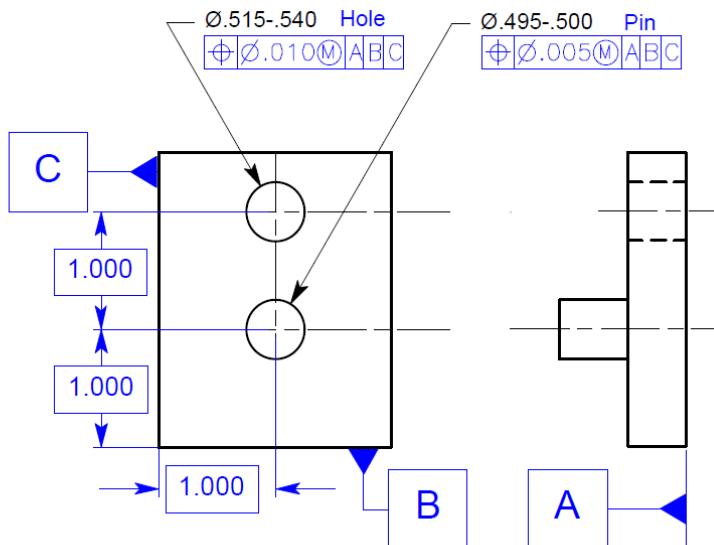
Two identical pipes of length L , diameter D and friction factor f are connected in series between two reservoirs. The size of a pipe of length L and of the same friction factor f , equivalent to the above pipes, is

- a) $0.5D$
- b) $0.87D$ (ANSWER)
- c) $1.15D$
- d) $1.40D$

(EXPLANATION – $h_1 + h_2 = h_{eq}$; $Q_1 = Q_2 = Q_{eq} = Q$; $h = flv^2/(2gD)$; $v = Q/A$; $A = \pi * D^2/4$; $D_1 = D$; $D_2 = D$; $D_{eq} = ? \Rightarrow D_{eq} = 0.87D$)

1010.

1010.



What is the geometric tolerance for Hole ____ and Pin ____?

1011.

Two identical pipes of length L , diameter D and friction factor f , are connected in parallel between two reservoirs. The size of a pipe of length L and of the same friction factor f , equivalent to the above pipes, is

- a) $0.5D$ b) $0.87D$ c) $1.40D$ d) $2.0D$

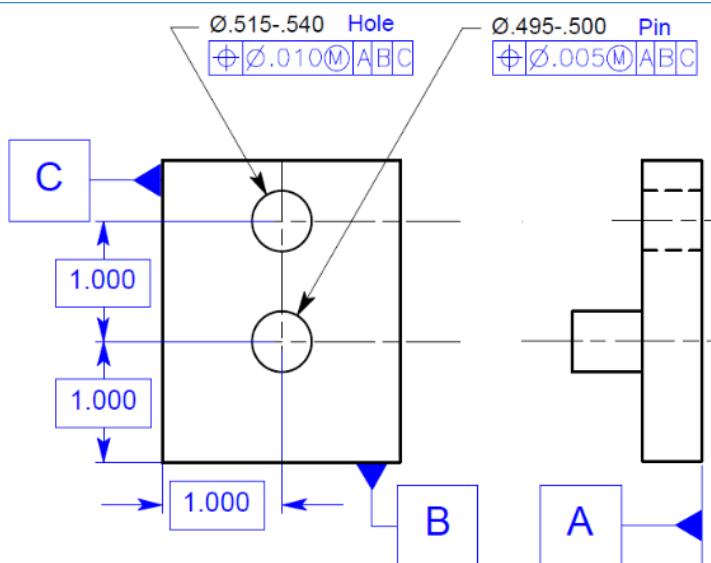
(ANSWER)

(EXPLANATION – $Q_1 + Q_2 = Q_{eq}$; $h_1 = h_2 = h_{eq} = h$; $h = flv^2/(2gD)$; $v = Q/A$; $A = \pi * D^2/4$; $D_1 = D$; $D_2 = D$; $D_{eq} = ?$

$$\Rightarrow D_{eq} = 2D$$

1012.

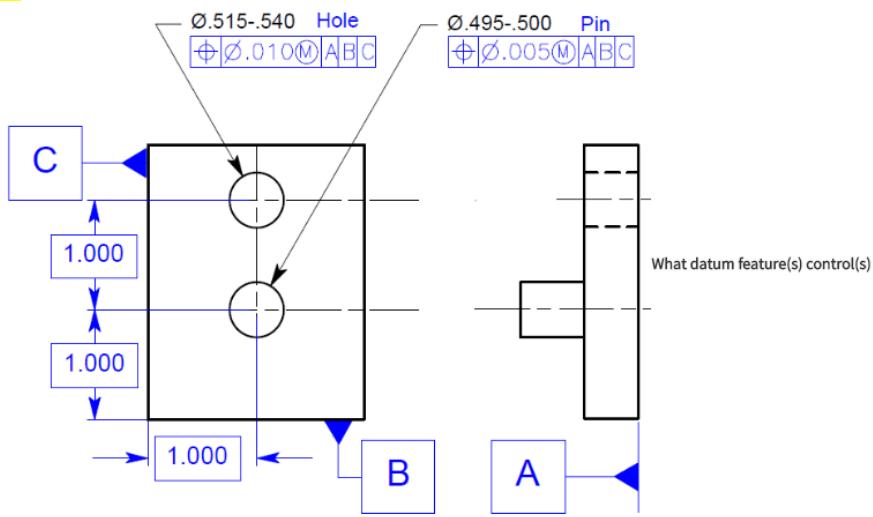
1012.



What material condition modifier is specified in the above figure for Hole____ and Pin____?

1013.

1013.



perpendicularity for Hole _____ and Pin _____?

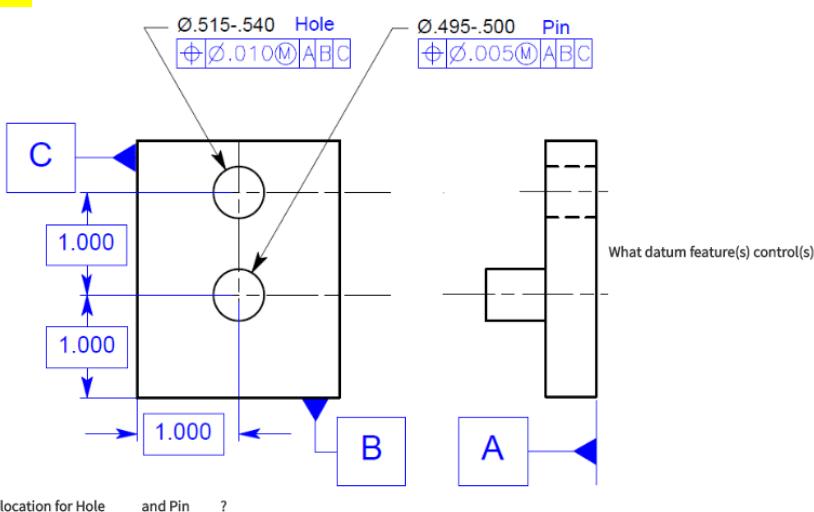
1014.

In using Darcy-Weisbach equation for flow in a pipe, the friction factor is misjudged by +25%. The resulting error in the estimated discharge Q is

- a) +25% b) -16.67% c) -5% d) -12.5% (**ANSWER**)

1015.

1015.



location for Hole ____ and Pin ____?

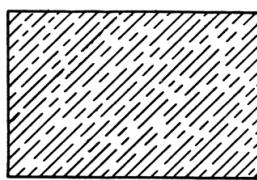
1016.

A pipeline connecting two reservoirs has its diameter reduced by 10% over a length of time due to chemical deposit action. If the friction factor remains unaltered, for a given head difference in the reservoirs this would reflect in a reduction in discharge of

- a) 10% b) 14.6% c) 23.2% (**ANSWER**) d) 31.6%

1017.

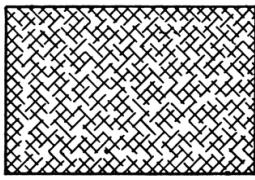
Conventional representation of Aluminium and its alloys are illustrated as



(ANSWER)

1018.

Conventional representation of Lead, Zinc, Tin are illustrated as



(ZINC – ANSWER)

1019.

Conventional representation of cork, linoleum are illustrated as

1020.

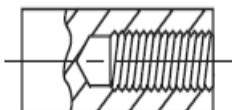
Conventional representation of a mixture of cement, sand and gravel is illustrated as



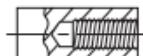
•CONCRETE•IN•SECTION• (ANSWER – CONCRETE = CEMENT + SAND + GRAVE)

1021.

What is the conventional representation of the figure shown in figure below.

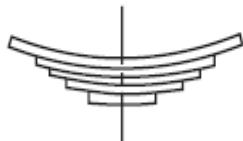


Internal
screw
threads
(Detail)



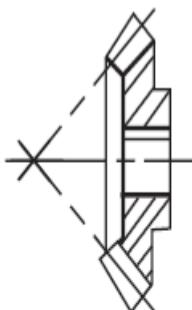
1022.

What is the conventional representation of the figure shown in figure below



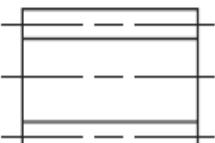
1023.

What is the conventional representation of the figure shown in figure below



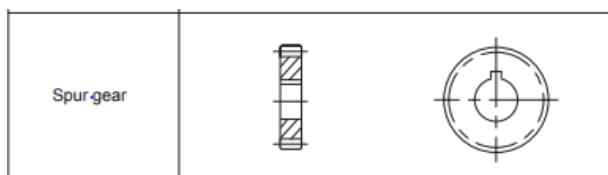
1024.

What is the conventional representation of the figure shown in figure below



1025.

What is the conventional representation of spur gear?



1026.

This type of section is limited by a break line:

- A. Removed section
- B. Revolved section
- C. Broken-out section
- D. Half section

Answer: Option C

1027.

If a client of yours is having difficulty visualizing a design, what type of drawing would be the easiest to understand?

- A) three view orthographic
- B) axonometric
- (ANSWER)**
- C) biometric
- D) one view orthographic

1028.

Which of the following is not a pictorial drawing?

- A) Isometric
- B) multiview **(ANSWER)**
- C) perspective
- D) axonometric

A number of forces acting at a point will be in equilibrium if sum of resolved parts in the vertical direction is zero (i.e. $\sum V = 0$)

D' Alembert's principle is used for

The principle states that the sum of the differences between the forces acting on a system of mass particles and the time derivatives of the momenta of the system

itself along any virtual displacement consistent with the constraints of the system, is zero.

Increase in entropy of a system represents degradation of energy

Following is the theoretical size which is common to both the parts of a mating pair

a. Base size

Which one of the following is the correct statement?

The degree of reaction of an impulse turbine:

The shearing area of a key of length 'L', breadth 'b' and depth 'h' is equal to

A heavy ladder resting on floor and against a vertical wall may not be in equilibrium, if floor and wall both are smooth surfaces

Consider the following statements:

A splined shaft is used for

- 1. Transmitting power**
- 2. Holding a flywheel rigidly in position**
- 3. Moving axially the gear wheels mounted on it**
- 4. Mounting V-belt pulleys on it.**

Of these statements

1 AND 3 ARE CORRECT.

449.

When two shafts are neither parallel nor intersecting, power can be transmitted by using

Worm gear

450.

One tonne of refrigeration (1TR) means that the heat removing capacity is

210kj/min

451.

A Francis turbine is used when the available head of water is

25m to 250 m

452.

. Among the following options, pick the line standard of measurement

453.

Consider the following statements regarding an impulse turbine:

1. Relative velocity at the inlet and exit of the rotor blades are the same.

2. Absolute velocity at the inlet and exit of the rotor blades are the same.

3. Static pressure within the rotor blade channel is constant.

4. Total pressure within the rotor blade channel is constant.

Of these statements:

1 and 3 are correct.

454.

In the formulation of Lewis equation for toothed gearing, it is assumed that tangential tooth load F_t , acts on the

Tip of the tooth

455.

Specific speed of a Kaplan Turbine ranges between 100 or more

456.

When trying to turn a key into a lock, following is applied couple

457.

The angle gauge by Dr. Tomlinson consists of a set of

_____ 10 gauges _____

458.

The principle of 'Inter-changeability' is normally employed for _____

a. Mass production

b. Production of identical parts

c. Parts within the prescribed limits of sizes

459.

If reduction ratio of about 50 is required in a gear drive, then the most appropriate gearing would be

Worm wheel

460.

In a 50% reaction turbine stage, tangential component of absolute velocity at rotor inlet is 537 m/s and the blade velocity is 454 m/s. The power output in kW for unit steam flowrate will be

461.

A number of forces acting at a point will be in equilibrium if

All of them are inclined equally

462.

Consider the following characteristics:

1. The fluid enters the pump axially and is discharged radially
2. Maximum efficiency may be of the order of 90%
3. Development of a low head
4. A limited suction capacity

Which of the above characteristics are possessed by axial flow pumps?

2 and 3

463.

Which one of the following is the correct statement?

The degree of reaction of an impulse turbine:

464.

Following is the theoretical size which is common to both the parts of a mating pair

Base size

467.

The shearing area of a key of length 'L', breadth 'b' and depth 'h' is equal to

$L * B$

468.

Consider the following statements:

A splined shaft is used for

1. Transmitting power
2. Holding a flywheel rigidly in position
3. Moving axially the gear wheels mounted on it
4. Mounting V-belt pulleys on it.

Of these statements

469.

Braking jet in an impulse turbine is used

To bring the runner to rest in short time

471.

The temperature of water flowing through the turbine increases from 25°C to 27°C due to friction. If there is no heat transfer, determine the change of entropy of water.

472.

_____ is equal to the differences of the two limits of size of the part

473.

The amount by which the actual size of a shaft is less than the actual size of mating hole in an assembly
Interference

474.

A paddle wheel fitted with a 300 W motor is used to stir water in a large container. The water in the container is maintained at 300 K and if the motor runs for 2 hours, determine the change in entropy of water.

475.

In the welded joint shown in the given figure, if the weld at B has thicker fillets than that at A, then the load carrying capacity P, of the joint will
Remain unaffected

477.

The ratio of limiting friction and normal reaction is known as

Coefficient of friction

478.

_____ is the basis of interferometry

479.

Which of the following stresses are associated with the design of pins in bushed pin-type flexible coupling?

- | | |
|-------------------------|----------------------------|
| 1. Bearing stress | 2. Bending stress |
| 3. Axial tensile stress | 4. Transverse shear stress |

Select the correct answer using the codes given below
480.

Pick up wrong statement about friction force for dry surfaces.
Friction force is

Proportional to velocity of sliding
481.

A system of 100 kg mass undergoes a process in which its specific entropy increases from 0.3 kJ/kgK to 0.4 kJ/kgK. At the same time, the entropy of the surroundings decreases from 80 kJ/K to 75 kJ/K. Determine the process.

irreversible

481.

482.

If the enthalpy drops of moving blade and fixed blade of a stage in a reaction turbine are 9 and 11 kJ/kg respectively,

then degree of reaction of the stage is

0.45

483.

The degree of reaction of a turbine is the ratio of enthalpy drop in
484.

When pressure is raised in an isentropic process, the enthalpy of the substance
485.

A 1.5mm surface is being measured on an interferometer. A lamp is used which can emit wave lengths as follows.

Red: 0.842 μm , Blue: 0.6628 μm .

What are the nominal fractions expected for the gauge for the two wave lengths?

486.

The angle of twist for a transmission shaft is inversely proportional to
Shaft diameter power 4

487.

Coulomb friction is the friction between
Kinetic friction is independent of the sliding velocity.

488.

Dynamic friction as compared to static friction is
LESS

489.

A muff coupling is
the **muff** or sleeve is made into two halves parts of the cast iron and they are joined together by means of mild steel studs or bolts. The advantages of this **coupling** is that assembling or disassembling of the **coupling** is possible without changing the position of the shaft.

90.

In motion and time study which of the following is used in product analysis?

Time study is a direct and continuous observation of a task, using a timekeeping device (e.g., decimal minute stopwatch, computer-assisted electronic stopwatch, and videotape camera) to record the time taken to accomplish a task^[3] and it is often used when:^[4]

- there are repetitive work cycles of short to long duration,
- wide variety of dissimilar work is performed, or
- process control elements constitute a part of the cycle.

The Industrial Engineering Terminology Standard, defines time study as "a work measurement technique consisting of careful time measurement of the task with a time measuring instrument, adjusted for any observed variance from normal effort or pace and to allow adequate time for such items as foreign elements, unavoidable or machine delays, rest to overcome fatigue, and personal needs."^[5]

491.

The dryness fraction at the end of expansion of a Reheat cycle operating under the same temperature limits has

492.

Cylindricity measurement comes under the category of

How close an object is to become a true cylinder.

493.

Which one of the following thermodynamic relations is incorrect

494.

"Piston -profile tester" is an instrument to check

Diameter, ovality

495.

The maximum shear stress in the spring is induced at

496.

The maximum frictional force which comes into play when a body just begins to slide over another surface is called

Limiting friction

497.

Consider the following statements regarding the axial flow in an air compressor:

1. Surging is a local phenomenon while stalling affects the entire compressor.
2. Stalling is a local phenomenon while surging affects the entire compressor.
3. The pressure ratio of an axial compressor stage is smaller than that of a centrifugal compressor stage.

Of these statements

1 and 3 are correct.

498.

NO-GO gauge checks the _____

A **go-no gauge** (or **go/no-go**) refers to an inspection tool **used** to check a workpiece against its allowed tolerances

499.

A flywheel on a motor goes from rest to 1000 rpm in 6 sec. The number of revolutions made is nearly equal to

500.

When a helical spring is cut into two halves, the stiffness of each spring will be

double

501.

Which one of the following is the extensive property of a thermodynamic system?

volume

502.

The hydraulic efficiency of a reaction turbine, is the ratio of

workdone on the wheel to the energy (or head of water) actually supplied to the turbine

503.

Fatigue failure results due to fluctuating stresses when the stress magnitude is

Considerably lower than the ultimate and yield strength.

504.

The sequence of events that eventually returns the working fluid to its original state is known as

Reversible cycle.

505.

In motion and time study which of the following is used in man analysis?

506.

A boat is traveling along a circular path having a radius of 20 m. Determine the magnitude of the boat's acceleration if at a given instant the boat's speed is $v = 5$ m/s and the rate of increase in speed is $v = 2 \text{ m/s}^2$.

507.

GO gauge checks the _____

A **go-no gauge** (or **go/no-go**) refers to an inspection tool used to **check** a workpiece against its allowed tolerances

508.

In unilateral tolerance system, the gauge tolerance zones lie entirely within the Working tolerance zone.

509.

A train travels along a horizontal circular curve that has a radius of 200 m. If the speed of the train is uniformly increased from 30 km/h to 45 km/h in 5 s, determine the magnitude of the acceleration at the instant the speed of the train is 40 km/h.

510.

Rankine theory of failure is applicable to brittle

511.

The function of the draft tube in a reaction turbine is The **draft tube** is a conduit which connects the runner exit to the tail race where the water is being finally discharged from the **turbine**. The primary **function of the draft tube** is to reduce the velocity of the discharged water to minimize the loss of kinetic energy at the outlet.

512.

If C is the number of components and φ is the number of phases in a system, the number of independent intensive properties required to specify the state of the system

$$P+f=c+2$$

513.

The mechanism used in a shaping machine is A shaper is a type of machine tool that uses **linear** relative motion between the workpiece and a single-point **cutting** tool to machine a **linear** toolpath. Its **cut** is analogous to that of a lathe, except that it is (archetypally) **linear** instead of **helical**.

514.

Distortion energy theory of failure is applicable to ductile

515.

Which of the following curve has a negative slope for water as working fluid in the P-T phase diagram

Molar volume of liquid is less than molar volume of solid.

516.

Which option given here is not the limitations/disadvantages of limit gauges

These are advantages :

Quicker Inspection Method

Used In-Mass Production

Ensure Interchangeability

Need Semiskilled Operator

517.

Which of the following is unavoidable delay?

Fortunately unavoidable delays are rare. But there have been instances where the builder's hands were truly tied. This happened several years ago when elevator workers went on strike. Without these workers, the builder could not complete the elevators. And without

elevators, he couldn't get an occupancy permit from the City.

518.

The most important objective behind plant layout is

overall simplification, safety of integration

519.the work output of a Reheat cycle operating under the same temperature limits is:

Work output = work done by turbine – work done by compressor.

521.

The lengths of the links of a 4-bar linkage with revolute pairs only are p, q, r and s units. Given that $p < q < r < s$. Which of these links should be the fixed one, for obtaining a "double crank" mechanism?

522.

Griffith's law states that fracture strength brittle material is

The Griffiths equation describes the relationship
between applied nominal stress and crack length at fracture, i.e. when it becomes energetically favourable for a crack to grow. Griffith was concerned with the energetics of fracture, and considered the energy changes associated with incremental crack extension

523.

Flat head rivets are used in

A method popularized by Chris Heintz of Zenith Aircraft uses a common **flat-head (countersunk) rivet** which is drawn into a specially machined nosepiece that forms it into a round **head rivet**, taking up much of the variation inherent in hole size found in amateur aircraft construction.

524.

The main aim of compounding of steam turbine is to In velocity compounding the pressure drops only in nozzle from boiler pressure to condense pressure and the velocity of steam decreases as moving over set of fixed and moving blades.

In pressure compounding the pressure of steam decreases to condenser pressure as it passed all over the stages of fixed and moving blades and in nozzle also.so, pressure decreases stage by stage.

In velocity and pressure compounding, the combination of both happens..

525.

Which of the following statements about absolute zero temperature is true?

First of all, the gas will no longer be a gas at absolute zero, but rather a solid. As the gas is cooled, it will make a phase transition from gas into liquid, and upon further cooling from liquid to solid (ie. freezing)

526.

Reference gauges are also known as

527.

The number of degrees of freedom of a planar linkage with 8 links and 9 simple revolute joint is

3

528.

_____ may be used to check the contour of a profile of work piece for conformance to certain shape.

Profile gauge.

529.

In a four- bar linkage, S denotes the shortest link length, L is the longest link length, P and Q are the lengths of other two links. At least one of the three moving links will rotate by 360 degree if

A) $S + L \leq P + Q$

530.

Productivity can be rational defined by

531.

Maximum shear stress theory is used for Ductile material.

532.

What mass of He gas occupies 8.5 liters at 0°C and 1 atmosphere? (The molar mass of He = 4.00 g/mol.)

1.52g

533.

Mobility of a statically indeterminate structure is Less than or equal to -1.

534.

A gas has a density X at standard temperature and pressure. What is the new density when the absolute temperature is doubled and the pressure increased by a factor of 3?

By a factor of 3/2

535.

What is the productivity for a company produces 40kg of plastic parts of acceptable quality by consuming 50kg of raw material

1.2

536.

Resilience of a material is important, when it is subjected to Shock loading

537.

A template gauge comes under the category of

This template accepts a track gauge and returns that **defined track gauge** well formatted, plus the **converted size value** by another unit:

38.

Stress concentration in static loading is more serious in Brittle material. For cyclic loading it is ductile material.

539.

A rigid container of air is at atmospheric pressure and 27°C . To double the pressure in the container, heat it to 327 celsius.

540.

For a four bar linkage in toggle position, the value of mechanical advantage is?

Infinite.

541.

The tool maker's microscope is based on the principle of

the tool maker's microscope is based on the principle of optics. The microscope consists of a heavy, hollow base ; accommodates the illuminating unit underneath

542.

Based on the direction of flow, which one of the following turbines is different from the other three?

Keplan turbine.

543.

The mechanism used in a shaping machine is

A shaper is a type of machine tool that

uses **linear** relative motion between the workpiece and a single-point**cutting** tool to machine a **linear** toolpath.

Its **cut** is analogous to that of a lathe, except that it is (archetypally)**linear** instead of **helical**.

544.

One of the following doesn't mean "Partial Productivity"

Measurement of **partial productivity** refers to

the measurement solutions which do not meet the

requirements of total productivity measurement, yet,

being practicable as indicators of total productivity. In

practice, measurement in production means measures of partial productivity. In that case, the objects of

measurement are components of total productivity, and

interpreted correctly, these components are indicative of productivity development. The term of partial productivity illustrates well the fact that total productivity is only

measured partially – or approximately. In a way,

measurements are defective but, by understanding the logic of total productivity, it is possible to interpret

correctly the results of partial productivity and to benefit from them in practical situations

545.

Bushed pin flexible coupling is used to joint two shafts which Power from input shaft to input flange through key. From it via outerbrush to output shaft.

546.

If a mass of oxygen gas occupies a volume of 8 L at standard temperature and pressure, what is the change in the volume if the temperature is reduced by one half and the pressure is doubled?

Reduced by 1/4th

547.

A collimator is a device that narrows a beam of particles or waves

A **collimator** is a device that narrows a beam of particles or waves. To narrow can mean either to cause the directions of motion to become more aligned in a specific direction (i.e., make collimated light or parallel rays), or to cause the spatial cross section of the beam to become smaller (**beam limiting device**).

548.

If the pressure and volume of an ideal gas are both reduced to half their original value, the absolute temperature of the gas is

Reduced to 1/th.

549.

Inter-changeability is the ability to select components for assembly at random and fit them together within proper tolerances

Yes, correct statement.

550.

The lengths of the links of a 4-bar linkage with revolute pairs only are p, q, r and s units. Given that $p < q < r < s$. Which of these links should be the fixed one, for obtaining a "double crank" mechanism?

Link of length p.

551.

For prosperity growth of any business we need

Answer can be written according to options.

552.

The sleeve or muff coupling is designed as a Hollow shaft.

553.

Following type of pipe joint is mostly used for pipes carrying water at low pressures

Socket joint.

554.

In order to draw the acceleration diagram, it is necessary to determine the

Coriolis component of acceleration in the case of crank and slotted lever quick return mechanism

555.

. In a lathe, to check the Parallelism of the Main Spindle to Saddle Movement, we conduct _____ This has to be checked in both vertical and horizontal planes. In this we require the use of mandrel. An important precaution in the use of mandrels and dial indicator is mentioned here. The mandrel must be so proportioned that its overhang does not produce appreciable sag, or else the sag must be calculated and accounted for. The rigidity indicator set up is also very important and must

be carefully watched. Otherwise variations in readings are recorded by pointer may be solely due to deflection of the indicator mounting in different positions and it becomes very difficult to detect and isolate the spurious deflection from the true variations.

If axis of the spindle is not parallel to bed in horizontal direction, a tapered surface is produced.

Any deviation from parallelism of spindle axis from bed in vertical axis will produce a hyperboloid surface. For this test, a mandrel is fitted in the taper socket of the spindle. Mandrel has a concentric taper shank which is close fit to the spindle nose taper. The feeler of the dial indicator is pressed on the mandrel and the carriage is moved

556.

The determination of standard time in a complex job system is best done through analysis of standard data system

557.

The relationship between the pressure and the volume of a gas expressed by Boyle's law holds true

$$P_1 V_1 = P_2 V_2$$

558.

Which of the following are the principles of material handling?

- It should be able determine appropriate distance to be covered.
- Facilitate the reduction in material damage as to improve quality.
- Reducing overall manufacturing time by designing efficient material movement
- Improve material flow control

- Creation and encouragement of safe and hazard-free work condition
- Improve productivity and efficiency
- Better utilization of time and equipment

559.

For two parallel shafts, the distance between whose axes is small and variable, which coupling will you use? Oldham coupling.

560.

The direction of linear velocity of any point on a link with respect to another point on the same link is perpendicular to the link joining the points

561.

An _____ interferometer is a device in which two or more light waves are combined together to produce interference
Optical interferometer.

562.

The air around us has 78% nitrogen and 21% oxygen. If the pressure is 1 atm, the pressure due to oxygen is

563.

Which of the following type of layout is suitable for automobile manufacturing concern?

Product layout.

564.

The trap end of the a connecting rod of steam engine is joined by

565.

The work output of theoretical Otto cycle

- a) increases with increase in compression ratio
 - b) increases with increase in pressure ratio
- b) both of them.**

566.

Ball and socket forms a

The **ball and socket** joint (or spheroidal joint) is a type of synovial joint in which the **ball**-shaped surface of one rounded bone fits into the cup-like depression of another bone. The distal bone is capable of motion around an indefinite number of axes, which have one common center

567.

A screw thread measurement involves

A **screw thread**, often shortened to **thread**, is a helical structure used to convert between rotational and linear movement or force. A screw thread is a ridge wrapped around a cylinder or cone in the form of a helix, with the former being called a *straight* thread and the latter called a *tapered* thread. A screw thread is the essential feature of the screw as a simple machine and also as a fastener.

568.

A combination of kinematic pairs, joined in such a way that the relative motion between link is completely constrained, is called as Kinematic chain.

569.

A diffuser is used to

A diffuser is "a device for reducing the velocity and increasing the static pressure of a fluid passing through a system". **Diffusers** are **used** to slow the fluid's velocity while increasing its static pressure. ... A typical,

subsonic diffuser is a duct that increases in size in the direction of flow.

Next

570.

2-wire and 3-wire methods measure

Pitch diameter.

571.

In Rankine cycle the work output from the turbine is given by

change of enthalpy between inlet and outlet

572.

Which of the following pipe joints would be suitable for pipes carrying steam

expansion

573.

The stagnation pressure rise in a centrifugal compressor takes place

In diffuser and impeller.

574.

Universal coupling is used to join two shafts

A universal joint (universal coupling, U-joint, Cardan joint, Spicer or Hardy Spicer joint, or Hooke's joint) is a joint or coupling connecting rigid rods whose axes are inclined to each other, and is commonly used in shafts that transmit **rotary motion**

575.

which of the following is an inversion of slider crank chain?

Pendulum pump

b) Oscillating cylinder engine

c) Rotary internal combustion engine

d) All of the mentioned

D is the correct.

576.

Calibration is performed to _____

Calibration in measurement technology

and metrology is the comparison of measurement values delivered by a device under test with those of a calibration standard of known accuracy. Such a standard could be another measurement device of known accuracy, a device generating the quantity to be measured such as a voltage, or a physical artefact, such as a metre ruler.

577.

For a single stage impulse turbine with a rotor diameter of 2 m and a speed of 3000 rpm when the nozzle angle is 20° , the optimum velocity of steam in m/s is

578.

What a calibration certificate contains

A calibration certificate documents critical information about a piece of equipment and details surrounding its calibration. While a deliberate amount of flexibility is allowed depending on service level options and customer requirements, every calibration certificate should contain some key elements.

579.

The most important dimension in the design of nut is Height.

580.

In SHM motion, acceleration is proportional to

An object is undergoing **simple harmonic motion (SHM)** if; the acceleration of the object

is **directly proportional** to its displacement from its equilibrium position. the **acceleration** is always directed towards the equilibrium position.

581.

Gauge blocks are a system for producing precision lengths

Gauge blocks (also known as **gage blocks, Johansson gauges, slip gauges**, or **Jo blocks**) are a system for producing precision lengths. The individual gauge block is a metal or ceramic block that has been precision ground and lapped to a specific thickness. Gauge blocks come in sets of blocks with a range of standard lengths. In use, the blocks are stacked to make up a desired length.

582.

Manometric efficiency of a centrifugal pump is defined as the ratio of it is the ratio of manometric head to the head imparted by the impeller(Euler's head) to the fluid.

583.

The valve rod in a steam engine is connected to an eccentric rod by
knuckle joint

584.

For a SHM motion of the follower, a cosine curve represents Acceleration diagram.

585.

Strain energy is the

The external work done on an elastic member in causing it to distort from its unstressed state is transformed into **strain energy**which is a form of potential **energy**. The **strain energy** in the form of elastic deformation is mostly recoverable in the form of mechanical work.

586.

Which one of the following helps in avoiding cavitation in centrifugal pumps?

Suction pressure should be high.

587.

An important feature of gauge blocks is that they can be joined together with very little dimensional uncertainty

An important feature of gauge blocks is that they can be joined together with very little dimensional uncertainty.

The blocks are joined by a sliding process

called *wringing*, which causes their ultra-flat surfaces to cling together. A small number of gauge blocks can be used to create accurate lengths within a wide range

588.

cam size depends on

base circle.

589.

Transmission angle is the angle between

Acute angle between coupler and follower.

590.

The object of caulking in a riveted joint is to make the joint

Leak proof.

591.

In a pelton Wheel the bucket peripheral speed is 10 m/s, the water jet velocity is 25 m/s and volumetric flow rate of the jet is $0.1\text{m}^3/\text{s}$. If the jet deflection angle is 120° and the flow is ideal, the power developed is

22.5kw

592.

The _____ on thickness of tooth is the variation of actual thickness of tooth from its theoretical value

593.

A fixed gear having 200 teeth is in mesh with another gear having 50 teeth. The two gears are connected by an arm. The number of turns made by the smaller gear for one revolution of arm about the centre of bigger gear is

4

594.

A Pelton wheel turbine is,

The Pelton wheel extracts energy from the impulse of moving water, as opposed to water's dead weight like the traditional overshot water wheel. Many variations of impulse turbines existed prior to Pelton's design, but they were less efficient than Pelton's design

595.

Why Micrometer carries a ratchet stop?

The spindle **carries** a graduated thimble which turns at one with it. ... To overcome this problem the **ratchet stop** is fitted.

596.

A steel bar of 5 mm is heated from 15°C to 40°C and it is free to expand. The bar Will induce

No stress.

597.

What are the reasons behind false reading on Micrometer while taking measurements?

Zero error.

Dirty workpiece or measuring faces of micrometer.

Unengaged ratchet stop.

Taking measurement when jobin motion. Etc.

98.

A body is subjected to a tensile stress of 1200 MPa on one plane and another tensile stress of 600 MPa on a plane at right angles to the former. It is also subjected to a shear stress of 400 MPa on the same planes. The maximum normal stress will be
1400mpa

599.

Kaplan turbine need to have the following for maintaining high efficiency

The **Kaplan turbine** is a propeller-type water turbine which has adjustable blades. It was developed in 1913 by Austrian professor Viktor Kaplan,^[1] who combined automatically adjusted propeller blades with automatically adjusted wicket gates to achieve efficiency over a wide range of flow and water level.

600.

In ideal machines, mechanical advantage is _____ velocity ratio.

Equal to