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Booklet Serial No. 003477

Test Booklet Series

TEST BOOKLET - 2022

FOREMAN ENGINEERING

(20)

A

Time Allowed: Two Hours ***Maximum Marks: 100***

INSTRUCTIONS

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6. All items carry equal marks.

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10. **Penalty for wrong answers:**
THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY THE CANDIDATE.
   (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **0.25** of the marks assigned to that question will be deducted as penalty.
   (ii) It a candidate gives more than one answer, it will be treated as a **wrong answer** even if one of the given answers happens to be correct and there will be same penalty as above for that question.
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SEAL

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1. The estimation of the solidification time of casting is given by

$t = C.M$

where C is the constant and M is called a Modulus Modulus is the ratio of

A) Density and Specific heat of the material to be cast

B) Mass and Specific heat of the material to be cast

C) Volume and Surface area

D) The density of the material and Surface area of the mould cavity

2. Identify the type of core required to produce a hole in the casting which does not fall in the parting line is _____

A) Balanced core

B) Drop core

C) Horizontal core

D) Vertical core

3. Match the Products in List I with the preferred Manufacturing process in the List II

List I Products		**List II Manufacturing Process**	
P	Rails	1	Blow moulding
Q	Automotive crankshafts	2	Extrusion
R	Aluminium channels	3	Forging
S	Plastic water bottles	4	Rolling

A) P -4, Q - 3, R - 1, S - 2

B) P - 4, Q - 3, R - 2, S - 1

C) P - 2, Q - 4, R - 3, S - 1

D) P - 3,Q - 4, R - 2, S - 1

4. A heavy ladder resting on the floor and against a vertical wall may not be in equilibrium, if

A) The floor is smooth and the wall is rough

B) Both floor and the wall are smooth

C) Both floor and the wall are rough

D) The floor is rough and the wall is smooth

5. Does a roughing operation generally involve which one of the following combinations of cutting conditions? (Where v - cutting speed, f - feed, and d - depth of cut)

A) High v, f, and d

B) High v, low f, and d

C) Low v, high f, and d

D) Low v, f, and d.

6. The stress relief annealing process is carried out

A) Below transformation temperature

B) Above transformation temperature

C) Heating above and below the transformation temperature

D) Heating above transformation temperature and very rapid cooling

7. The tensile strength and creep resistance of metal can be increased by

A) Increase in grain size

B) Addition of dispersoids

C) Decrease in grain size

D) Annealing

8. The mechanism of plastic deformation at low temperatures is mainly governed by

A) Twining and slip

B) Dislocation-climb and slip

C) Dislocation-climb and vacancy diffusion

D) Viscous flow and slip and diffusion creep

9. In thermodynamics, the law of conservation of energy is expressed in the form of

A) Zeroth law of thermodynamics

B) The first law of thermodynamics

C) The second law of thermodynamics

D) Third law of thermodynamics

10. Match the Crystal structure with the packing factor in the following table

	Crystal structure		**Atomic packing factor**
P	Body Centred Cubic (BCC)	1	0.34
Q	Diamond Cubic	2	0.52
R	Simple Cubic	3	0.74
S	Hexagonal Close Packed (HCP)	4	0.68

A) P - 3, Q - 2, R - 1, S - 4

B) P - 4, Q - 1, R - 2, S - 3

C) P - 2, Q - 3, R - 1, S -4

D) P -4, Q - 3, R - 1, S - 2

11. Fibrous fracture observed in _____

A) Brittle material

B) Ductile material

C) Ceramic material

D) Hard material

12. With reference to the Indian standard specifications, plain carbon steel designated as 40C8 has a carbon content that is

A) 0.04 %

B) 0.35 % to 0.45 %

C) 0.20 % to 0.60 %

D) 0.60 % to 1.0 %

13. During strain aging

A) Strength and ductility of the material increase

B) Strength and ductility of the material decreases

C) The strength and ductility of the material remain the same

D) Strength of the material increases but ductility decreases

14. Identify the microstructure of steel with 1.2 wt % of Carbon at 800°C is

A) All austenitic

B) Pearlitic grains and cementite along the grain boundaries

C) Austenitic grains with cementite growth on the grain boundaries

D) Ferrite grains with cementite growth on the grain boundaries

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

A) governor A is more sensitive than governor B

B) governor B is more sensitive than governor A

C) both governors A and B are equally sensitive

D) both governors A and B are equally insensitive

16. In a multi-plate friction clutch, the number of active surfaces is

A) 2n B) n

C) 2(n - 1) D) n - 1

17. V-block and dial indicator method is used to measure the

A) Length of the workpiece

B) The circularity of the cylindrical workpiece

C) Pitch of the screw tread

D) Pitch of the spur gear

18. 20 H7 - g6 is a

A) Clearance fit

B) Push-fit

C) Transition fit

D) Interference fit

19. A shaft diameter $40^{+0.05}_{-0.15}$ and a hole diameter $40^{+0.20}_{+0.10}$ when assembled would yield

A) Transition fit

B) Interference fit

C) Clearance

D) Press fit

20. The centrifugal tension in the belt drive

A) Increases power transmitted

B) Decreases power transmitted

C) Not affect the power transmission

D) Increases power transmitted up to a certain speed and then decreases

21. A flywheel connected to a punching machine has to supply energy of 450 Nm while running at a mean speed of 15 rad/s. If the total fluctuation of speed is not exceeded ±2%, the mass moment of inertia of the flywheel in $kg.m^2$ is

A) 25

B) 50

C) 100

D) 125

22. A certain machine requires a torque of $(500 + 50 \sin 2\theta)$ kN.m to drive it, where θ is the angle of rotation of the shaft measured from a certain datum. The machine is directly coupled to an engine that produces a torque $(500 + 50 \sin \theta)$ kN.m in a cycle. How many times the value of torque of the machine and engine will be identical?

A) 1 B) 2

C) 4 D) 8

23. Match Gear types in List I with applications in the List II

	List I		**List II**
P	Worm gears	1.	Parallel shafts
Q	Cross helical gears	2	Non-parallel, intersecting shafts
R	Bevel gears	3	Non-parallel, non- intersecting shafts
S	Spur gears	4	Large speed ratios

A) P - 4, Q - 3, R -2, S - 1

B) P - 1, Q - 3, R - 2, S - 4

C) P - 4, Q - 2, R - 3, S - 1

D) P -3, Q - 4, R -2, S - 1

24. Match Kinematic pairs in List I with Examples in the List II

	List I		**List II**
P	Sliding pair	1.	A roller rolling over the ground
Q	Revolute pair	2	Shoulder joint
R	Rolling pair	3	Piston and cylinder
S	Spherical pair	4	Crankshaft in a journal bearing of an engine

A) P -4, Q - 3, R -2, S - 1

B) P - 1, Q - 3, R - 2, S - 4

C) P -4, Q - 2, R - 3, S - 1

D) P - 3, Q -4, R - 1, S - 2

25. Assertion (A): Oldham coupling is used to transmit power between two parallel shafts that are slightly offset

Reason (R): There is no sliding member to reduce power in Oldham coupling.

A) Both A and R are individually true, and R is the correct explanation of A

B) Both A and R are individually true, but R is not the correct explanation of A

C) Statement A is true, but R is false

D) Statement A is false, but R is true

26. The binding material used in Tungsten carbide based cemented carbide tools is

A) Tungsten
B) Chromium
C) Nickel
D) Cobalt

27. The abrasives recommended for grinding materials of high-strength materials are

A) Silicon carbide
B) Aluminium oxide
C) Sandstone
D) Diamond

28. Identify the wrong statement from the following

A) The power transmitted by V-belts is less than flat belts for the same coefficient of friction, arc of contact, and allowable tension in the belts.
B) The V-belt drive is used with a large center distance
C) The V-belt may be operated in either direction with a tight side of the belt at the top or bottom
D) The ratio of driving tensions in V-belt drive is more than in flat belt drives

29. A vertical column has moments of inertia about two mutually perpendicular axes (Say Ixx and Iyy). The column will tend to buckle in the direction of the

A) The axis of the load
B) Perpendicular to the axis of the load
C) Maximum moment of inertia
D) Minimum moment of inertia

30. The buckling load for a column hinged at both ends is 10 kN. If the ends are fixed the buckling load changes to

A) 40 kN
B) 2.5 kN
C) 5 kN
D) 20 kN

31. A shaft is subjected to maximum bending stress of $80N/mm^2$ at a particular section. If the yield point in the tension of the material is 280 N/mm^2, and the maximum shear stress theory of failure is used, then the factor of safety obtained will be

A) 2.5
B) 2.8
C) 3.0
D) 3.5

32. A hollow shaft of the same cross-sectional area and material as that of a solid shaft can transmit

A) Same torque

B) Lesser torque

C) More torque

D) Half of the maximum torque that can be transmitted by the solid shaft

33. A steel bar of 10 mm diameter is heated from 15°C to 50°C and it is free to expand. The bar is subjected to

A) No stress

B) Shear stress

C) Tensile stress

D) Compressive stress

34. If a thin cylindrical shell is subjected to internal pressure, then there will be

A) A decrease in diameter and length of the shell

B) An increase in diameter and decrease in length of the shell

C) A decrease in diameter and increase in length of the shell

D) An increase in diameter and length of the shell

35. The friction experienced by a body, when it is in motion is known as

A) Rolling friction

B) Dynamic friction

C) Limiting friction

D) Static friction

36. Two parallel forces are acting at a distance of 24 mm apart and their resultant is 20N. If the line of action of the resultant is 6 mm from any given force, then the magnitude of the two forces are

A) 15 N and 5 N

B) 25 N and 5 N

C) 50 N and 30 N

D) 15 N and 15 N

37. In a bilateral system of tolerance, the tolerance is allowed on

A) One side of the actual size

B) One side of the nominal size

C) Both sides of the actual size

D) Both sides of the nominal size

38. A steel wheel of 600 mm in diameter rolls on a horizontal steel rail. It carries a load of 500 N. The coefficient of rolling resistance is 0.3 mm. The force N, necessary to roll the wheel along the rail is

A) 0.5 N
B) 5 N
C) 15 N
D) 150 N

39. Which of the following engine will require a heavier flywheel than the remaining?

A) 40 HP four-stroke petrol engine running at 1500 rpm
B) 40 HP two-stroke petrol engine running at 1500 rpm
C) 40 HP two-stroke diesel engine running at 750 rpm
D) 40 HP four-stroke diesel engine running at 750 rpm

40. The process that uses a tapered horn to amplify and focus the mechanical energy for machining glass is

A) Electrochemical machining
B) Electric discharge machining
C) Abrasive jet machining
D) Ultrasonic machining

41. Which of the following conditions is used to determine the stable equilibrium of all partially submerged floating bodies?

A) The metacenter must be at a higher level than the center of gravity
B) The Centre of buoyancy must be above the center of the gravity
C) The metacenter must be at a lower level than the center of gravity
D) The Centre of buoyancy must be below the center of gravity

42. Two plates each of 6 mm thickness, are to be butt-welded. Consider the following processes and rank them in increasing order of size of the heat-affected zone

1. Arc welding
2. MIG welding
3. Laser beam welding
4. Submerged arc welding

Find the correct answer

A) 1 - 4 - 2 -3
B) 4 - 3 - 2 - 1
C) 3 - 2 - 4 - 1
D) 3 - 4 - 2 - 1

43. Straight polarity in welding is best suited for

A) Thick material
B) Thin material
C) Non-metallic material
D) Non-conducting polymers

44. D'Alembert's principle is used for

A) Reducing the problem of kinematics to an equivalent static problem

B) Determine the stresses in the truss

C) Stability of floating bodies

D) Designing safe structures

45. A helical spring has stiffness 'k'. If the wire diameter, coil diameter, and the number of turns were doubled, then the stiffness is equal to

A) 8k B) 16k

C) k D) k/2

46. Slow plastic deformation of metals under constant stress is known as

A) Fatigue B) Creep

C) Endurance D) Non-plastic deformation

47. In an ideal refrigeration (reversed Carnot) cycle, the condenser and evaporator temperatures are 27°C and -13°C respectively. The COP of this cycle would be

A) 6.5 B) 7.5

C) 10.5 D) 15.0

48. Identify the correct statement from the following

A) Absolute pressure = Gauge pressure + Atmospheric pressure

B) Gauge pressure = Absolute pressure + Atmospheric pressure

C) Atmospheric pressure = Absolute pressure + Gauge pressure

D) Absolute pressure = Gauge pressure -Atmospheric pressure

49. In a Carnot engine, when the working substance gives heat to the sink

A) The temperature of the sink increases

B) The temperature of the sink remains the same

C) The temperature of the source decreases

D) The temperatures of both the sink and the source decrease

50. If the performance of S.I. engines of different manufacturers having different capacities, sizes, and systems are to be compared, the parameter would be

A) Engine cylinder diameter B) Brake power

C) Mean effective pressure D) Weight of the engine

51. The volumetric efficiency of a well-designed SI engine lies in the range of

A) 51% to 60%

B) 61% to 70%

C) 70% to 80%

D) 80% to 90%

52. The steady irrotational flow of an incompressible fluid is called

A) Steady flow.

B) Uniform flow.

C) Potential flow.

D) Viscous flow

53. Paper pulp is an example of

A) Newtonian fluid.

B) Non-Newtonian fluid.

C) Pseudoplastic fluid.

D) Bingham plastic.

54. The value of the coefficient of discharge of a venturi meter lies within the range of

A) 0.65-0.69. B) 0.75-0.79.

C) 0.85-0.89. D) 0.95-0.99

55. A change in angular momentum of fluid flowing in a curved path results in a

A) Change in total energy.

B) Change in force.

C) Change in pressure.

D) Torque.

56. When the pipes are connected in parallel, the total head loss

A) Is equal to the inverse of the sum of the head in each pipe.

B) Is equal to the sum of the loss of head in each pipe.

C) Is the same in each pipe.

D) Is half that of in each pipe.

57. A pipe is said to be equivalent to another pipe if
   A) Length and discharge are the same.
   B) The length and diameter are the same.
   C) Velocity and diameter are the same.
   D) Discharge and pressure head loss are the same

58. Maximum head loss occurs in
   A) U-bend.
   B) 30° bend.
   C) 60° bend.
   D) 90° bend.

59. In free convection heat transfer transition from laminar to turbulent flow is governed by the critical value of the
   A) Reynold's number
   B) Grashof s number
   C) Reynold's number and Grashof's number
   D) Prandtl's number and Grashof's number

60. Solar radiation of 1200 W/m^2 falls perpendicularly on a grey opaque surface of emissivity 0.5. If the surface temperature is 50°C and surface emissive power is 600 W/m^2, the radiosity of that surface will be
   A) 600 W/m^2
   B) 1000 W/m^2
   C) 1200 W/m^2
   D) 1800 W/m^2

61. The wavelength of radiation emitted by a body depends upon
   A) The nature of its surface
   B) The area of its surface
   C) The temperature of its surface
   D) The surface roughness of the surface

62. In flow through the pipe, the transition from laminar to turbulent flow does not depend on
   A) Density of fluid
   B) Length of pipe
   C) Diameter of the pipe
   D) The velocity of the fluid

63. A new temperature scale in degree N is to be defined. The boiling and freezing on this scale are 400°N and 100°N respectively. What will be the reading on the new scale corresponding to 60°C?

A) 120°N
B) 180°N
C) 220°N
D) 280°N

64. A body of weight 'W' is required to move up on a rough inclined plane whose angle of inclination with the horizontal is α. The coefficient of friction between the plane and the block is $\mu = \tan\phi$. The effort required to be applied parallel to the plane is expressed as

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

65. A body weighing 1000 N is dropped from a height of 10 cm over a close-coiled helical spring with of stiffness 200 N/cm. what would be the deflection of the spring?

A) 5 cm
B) 16 cm
C) 35 cm
D) 100 cm

66. Assertion (A): Concentric cylindrical helical springs are used to have greater spring force in a limited space

Reason (R): Concentric helical springs are wound in opposite directions to prevent locking of coils under heavy dynamic loading

A) Both A and R are individually true, and R is the correct explanation of A
B) Both A and R are individually true, and R is the not correct explanation of A
C) A is true and R is false
D) A is false and R is true.

67. If a two-mass system is dynamically equivalent to a rigid body, then the system will not satisfy the condition that the

A) Sum of the two masses must be equal to that of the rigid body
B) Polar moment of inertia of the system should be equal to that of the rigid body
C) Centre of gravity of the system should coincide with that of the rigid body.
D) Total moment of inertia of the masses about the axis through the center of gravity must be equal to that of the rigid body

68. In a double slider-crank mechanism , a point on a link connecting the sliders (excluding the endpoints) traces

A) Straight line

B) Circular path

C) Parabolic path

D) Elliptical path

69. Match the Products in List I with the required property in the List II

	List I Products		**List II required property**
P	Blades of earth-moving equipment	1	Higher wear resistance and toughness
Q	Gas turbine blades	2	Low Young's modulus and high fatigue strength
R	Drill tool	3	High wear and abrasion resistance
S	Springs for automobiles	4	High creep strength and good corrosion resistance

A) P - 3, Q - 2, R - 1, S - 4

B) P - 1, Q -4, R - 3, S - 2

C) P - 3, Q - 4, R - 1, S - 2

D) P - 1, Q - 2, R - 3, S - 4

70. Match the Unconventional machining process in List I with the Energy involved in the List II

	List I Unconventional machining process		**List II Energy involved**
P	Electro polishing	1	Thermal
Q	Electrochemical machining	2	Mechanical
R	Abrasive jet machining	3	Electrochemical
S	Electrical discharge machining	4	Chemical

A) P -4, Q - 3, R - 2, S - 1

B) P - 2, Q - 1,R -4, S - 3

C) P -4,Q - 1, R - 2, S - 3

D) P - 2,Q - 3, R - 4, S - 1

71. Assertion (A): Cast iron is generally hard, brittle, and wear-resistant.

Reason (R): Cast iron contains more than 2% carbon and the percentage of cementite in it is higher.

A) Both A and R are individually true, and R is the correct explanation of A

B) Both A and R are individually true, and R is the not correct explanation of A

C) A is true and R is false

D) A is false and R is true

72. Match the polymeric materials in List I with applications in the List II

List I Polymeric materials		List II Applications	
P	Fiber-reinforced plastics	1	Automobile tyres
Q	Acrylics	2	Aircraft
R	Phenolics	3	Lenses
S	Butadiene rubber	4	Electric switch cover

A) P - 1, Q - 4, R - 3, S - 2
B) P - 2, Q - 3, R -4, S - 1
C) P - 1, Q - 3, R -4, S - 2
D) P - 2, Q - 4, R - 3, S - 1

73. Consider the following statements relating to the mechanical properties of ceramics:
1. Tensile strength is theoretically high but in practice quite low.
2. Compressive strength is many times higher than tensile strength.
3. Shear strength is high
4. The hardness of the ceramics is very low. Which of the statements given above are correct?

A) 1 and 3 B) 1 and 4
C) 2 and 3 D) 2 and 4

74. Match List I with List II and select the correct answer using the code

List I		List II	
P	System	1	Free energy is a minimum
Q	Phase	2	Chemical elements or chemical compounds
R	Phase equilibrium	3	Consists of solids, liquids, or gases or their combination
S	Components	4	A homogeneous portion of a system that has uniform physical characteristics

A) P -2, Q - 1, R -4, S - 3 B) P - 3, Q - 1, R -4, S - 2
C) P - 2, Q - 4, R - 1, S - 3 D) P - 3, Q - 4, R - 1, S - 2

75. Misrun is a casting defect that occurs due to
A) Very high pouring temperature of the metal
B) Insufficient fluidity of the molten metal
C) Absorption of gases by the liquid metal
D) Improper alignment of the mould flasks

76. Which one of the following is the most likely characteristic in centrifugal casting?

A) Fine grain size and high porosity

B) Coarse grain size and high porosity

C) Fine grain size and high density

D) Coarse grain size and high density

77. In oxy-acetylene gas welding, for neutral flame, the volume of oxygen required per unit of acetylene is

A) 1

B) 1.5

C) 2

D) 2.5

78. Which of the following are the major characteristics of submerged arc welding?

1. High welding speeds
2. High deposition rates
3. Low penetration
4. Low cleanliness.

Select the correct answer using the code given below:

A) 2 and 3

B) 1, 2 and 3

C) 3 and 4

D) 1 and 2

79. A blank of 30 mm diameter is to be produced out of a 10 mm thick sheet on a simple die. If 6% clearance is recommended, then the nominal diameters of die and punch are respectively

A) 30.6 mm and 29.4 mm

B) 30.6 mm and 30 mm

C) 30 mm and 29.4 mm

D) 30 mm and 28.8 mm

80. Match List I with List II, and select the correct combination code given below

	List I		List II
P	Blanking	1	Tension
Q	Stretch forming	2	Compression
R	Coining	3	Shearing
S	Deep drawing	4	Tension and compression

A) P - 2, Q - 1, R - 3, S - 4

B) P - 2, Q - 4, R - 3, S - 1

C) P - 3, Q -4, R -2, S - 1

D) P - 3, Q - 1, R -2, S - 4

81. Which one of the following is the correct statement?

A) Extrusion is used for the manufacture of seamless tubes.

B) Extrusion is used for reducing the diameter of round bats and tubes by rotating dies which open and close rapidly on the work

C) Extrusion is used to improve the fatigue resistance of the metal by setting up compressive stresses on its surface.

D) Extrusion comprises pressing the metal inside a chamber to force it out by high pressure through an orifice that is shaped to provide the desired form of the finished part.

82. Identify the wrong statement about the gear hobbing process from the following

A) High rate of production

B) Generation of helical gears

C) Very accurate tooth profile

D) Generation of internal gears

83. The tail stock set over the method of taper turning is preferred for

A) Internal tapers

B) Small tapers

C) Long slender tapers

D) Steep tapers

84. In centreless grinding, the workpiece center will be

A) Above the line joining the two-wheel centers

B) Below the line joining the two-wheel centers

C) On the line joining the two-wheel centers

D) At the intersection of the line joining the wheel centers with the work plate plane

85. Specific cutting energy is more in the grinding process compared to turning because

A) Grinding (cutting) speed is higher

B) The wheel has multiple cutting edges (grains)

C) Ploughing force is significant due to the small chip size

D) The grinding wheel undergoes continuous wear

86. Flank wear occurs mainly on which of the following?

A) Nose part and top face

B) Cutting edge only

C) Nose part, front relief face, and side relief face of the cutting tool

D) Face of the cutting tool at a short distance from the cutting edge.

87. Three moles of an ideal gas are compressed to half the initial volume at a constant temperature of 300 K. The work done in the process is

A) 5188 J

B) 2500 J

C) -2500 J

D) -5188 J

88. Consider the following statements

For precision machining of non-ferrous alloys, diamond is preferred because it has

i. Low coefficient of thermal expansion

ii. High wear resistance

iii. High compression strength

iv. Low fracture toughness

Which of the statements are correct?

A) i and ii

B) i and iv

C) ii and iii

D) iii and iv

89. If the diameter of a long column is reduced by 20%, the percentage of reduction in Euler's buckling load is

A) 4%

B) 36%

C) 49%

D) 59%

90. A cube with a side length of 1 cm is heated uniformly at 1°C above room temperature and all the sides are free to expand. What will be the increase in the volume of the cube? If the coefficient of the thermal expansion for the cube material is α cm per °C)

A) $3\ \alpha\ cm^3$

B) $2\ \alpha\ cm^3$

C) $\alpha\ cm^3$

D) $0\ cm^3$

91. In a power transmission shaft, if the polar moment of inertia of a shaft is doubled then what is the torque required to produce the same angle of twist

A) 1/4 of the original value

B) 1/2 of the original value

C) Same as the original value

D) Double the original value

92. A solid shaft can resist a bending moment of 3.0 kN.m and a twisting moment of 4 kN.m together. Then the maximum torque that can be applied is

A) 7.0 kN.m

B) 3.5 kN.m

C) 4.5 kN.m

D) 5.0 kN.m

93. Four vertical columns of the same material, height, and weight have the same end conditions. Which cross-section will carry the maximum load?

A) Solid circular section

B) Thin hollow circular section

C) Solid square section

D) I - section

94. For laminar flow in a pipe carrying a given discharge, the height of the surface roughness is doubled. In such a case, the Darcy-Weisbach friction factor will

A) Remain unchanged

B) Be halved

C) Be doubled

D) Increase four times

95. Pressure loss for laminar flow through the pipeline is dependent

A) Inversely on the flow velocity

B) Directly on the square of the pipe radius

C) Directly on the length of the pipe

D) Inversely on the viscosity of flowing medium

96. A pipeline connecting two reservoirs has its diameter reduced by 20% due to salt sediments. For a given head difference in the reservoirs with an unaltered friction factor, this would cause a reduction in discharge of

A) 20%

B) 10.6%

C) 17.8%

D) 42.8%

97. In ideal machines

A) Mechanical advantage is greater than velocity ratio

B) Mechanical advantage is equal to velocity ratio

C) Mechanical advantage is less than velocity ratio

D) Mechanical advantage is unity

98. A rubber ball strikes a wall and rebounds. A lead ball of the same mass and velocity strikes the same wall and falls. Which of the following statements is correct?

A) Both undergo an equal change in momentum

B) The momentum of a rubber ball is less than that of a lead ball

C) The change in momentum suffered by a lead ball is less than that of a rubber ball

D) The behavior of lead ball and rubber ball is unpredictable

99. If the angle of friction is zero, a body will experience

A) Infinite friction

B) Zero friction

C) The force of friction will act normal on the plane

D) The force of friction will act in direction of motion

100. A block of mass 5 kg is thrust up at 30° inclined plane with an initial velocity of 4 m/sec. It travels a distance of 1.0 m before it comes to rest. The force of friction acting on it would be

A) 4

B) 5

C) 6

D) 15.5

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