

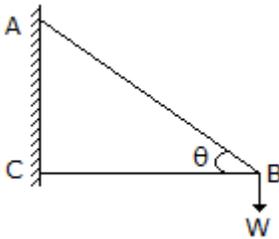
THDCIL  
JUNIOR ENGINEER(MECHANICAL )  
SAMPLE PAPER-III, 4/5/2017

## TECHNICAL

1. When a body of mass moment of inertia  $I$  (about a axis) is rotated about that axis with an angular velocity  $\omega$ , then the kinetic energy of rotation is

- a)  $I\omega$
- b)  $I\omega^2$
- c)  $0.5I\omega$
- d)  $0.5I\omega^2$

2 The force induced in the string BC due to the load  $W$  as shown in the below figure is



- a)  $W \sin \theta$
- b)  $W \cos \theta$
- c)  $W \tan \theta$
- d)  $W \cot \theta$

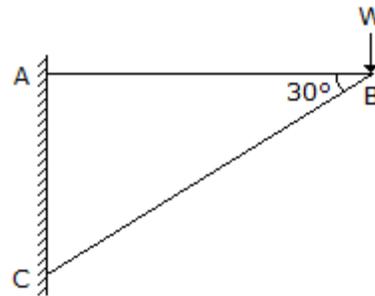
3 The velocity ratio of a differential wheel and axle with  $D$  as the diameter of effort wheel and  $d_1, d_2$  as the diameters of larger and smaller axles respectively, is

- a)  $\frac{D}{d_1 + d_2}$
- b)  $\frac{D}{d_1 - d_2}$
- c)  $\frac{2D}{d_1 + d_2}$
- d)  $\frac{2D}{d_1 - d_2}$

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

- a) downward at its upper end
- b) upward at its upper end
- c) zero at its upper end
- d) perpendicular to the wall at its upper end

5. In a framed structure, as shown in the below figure, the forces in the members AB and BC are respectively



- a)  $\sqrt{3}W$ (tensile) and  $2W$  (compressive)
- b)  $2W$ (tensile) and (compressive)
- c) (tensile) and (compressive)
- d) none of the above

6. A force while acting on a body may

- a) change its motion
- b) balance the forces, already acting on it
- c) give rise to the internal stresses in it
- D. all of these

7. The wheels of a moving car possess

- a) potential energy only
- b) kinetic energy of translation only
- c) kinetic energy of rotation only
- d) kinetic energy of translation and rotation both

8. The pressure at a point 4 m below the free surface of water is

- a) 19.24 kPa
- b) 29.24 kPa
- c) 39.24 kPa
- d) 49.24 kPa

9. A structure used to dam up a stream or river over which the water flows is called

- a). orifice
- b) notch
- c) weir
- d) dam

10. The coefficient of discharge for an external mouthpiece depends upon

- a) velocity of liquid
- b) pressure of liquid
- c) area of mouthpiece
- d) length of mouthpiece

11. The specific gravity of an oil whose specific weight is  $7.85 \text{ kN/m}^3$ , is

- a) 0.8
- b) 1
- c) 1.2

d) 1.6

12. The body will float if the force of buoyancy is \_\_\_\_\_ the weight of the liquid displaced.

- a) equal to
- b) less than
- c) more than
- d) any of the above

13. The divergent portion of a venturimeter is made longer than convergent portion in order to

- a) avoid the tendency of breaking away the stream of liquid
- b) to minimise frictional losses
- c) both (a) and (b)
- d) none of these

14. In a venturiflume, the flow takes place at

- a) atmospheric pressure
- b) gauge pressure
- c) absolute pressure
- d) none of these

15. The discharge through a channel of circular section will be maximum when the depth of water is \_\_\_\_\_ the diameter of the circular channel.

- a) 0.34 times
- b) 0.67 times
- c) 0.81 times
- d) 0.95 times

16. The discharge through a convergent mouthpiece is \_\_\_\_\_ the discharge through an internal mouthpiece of the same diameter and head of water.

- a) equal to
- b) one-half
- c) three fourth
- d) double

17. The error in discharge ( $dQ/Q$ ) to the error in measurement of head ( $dH/H$ ) over a triangular notch is given by

- a)  $\frac{dQ}{Q} = \frac{3}{2} \times \frac{dH}{H}$
- b)  $\frac{dQ}{Q} = 2 \times \frac{dH}{H}$
- c)  $\frac{dQ}{Q} = \frac{5}{2} \times \frac{dH}{H}$
- d)  $3 \times \frac{dH}{H}$

18. If the depth of water in an open channel is less than the critical depth, the flow is called

- a) critical flow
- b) turbulent flow
- c) tranquil flow
- d) torrential flow

19. In order to avoid tendency of separation at throat in a venturimeter, the ratio of the diameter at throat to the diameter of pipe should be

- a)  $\frac{1}{16}$  to  $\frac{1}{8}$
- b)  $\frac{1}{8}$  to  $\frac{1}{4}$
- c)  $\frac{1}{4}$  to  $\frac{1}{3}$
- d)  $\frac{1}{3}$  to  $\frac{1}{2}$

20. A vertical wall is subjected to a pressure due to one kind of liquid, on one of its sides. The total pressure on the wall acts at a distance \_\_\_\_\_ from the liquid surface.

- a)  $H/3$
- b)  $H/2$
- c)  $2H/3$
- d)  $3H/4$

21. A channel is said to be of most economical cross-section, if

- a) it gives maximum discharge for a given cross-sectional area and bed slope
- b) it has minimum wetted perimeter
- c) it involves lesser excavation for the designed amount of discharge
- d) all of the above

22. A moving fluid mass may be brought to a static equilibrium position, by applying an imaginary inertia force of the same magnitude as that of the accelerating force but in the opposite direction. This statement is called

- a) Pascal's law
- b) Archimede's principle
- c) D-Alembert's principle
- d) none of these

23. The magnitude of water hammer depends upon the

- a) elastic properties of the pipe material

- b) elastic properties of the liquid flowing through the pipe
- c) speed at which the valve is closed
- d) all of the above

**24. The discharge over a rectangular notch is**

- a) inversely proportional to  $H^{3/2}$
- b) directly proportional to  $H^{3/2}$
- c) inversely proportional to  $H^{5/2}$
- d) directly proportional to  $H^{5/2}$

**25. The pressure of the liquid flowing through the divergent portion of a venturimeter**

- a) remains constant
- b) increases
- c) decreases
- d) depends upon mass of liquid

**26. The height of a water column equivalent to a pressure of 0.15 MPa is**

- a) 15.3 m
- b) 25.3 m
- c) 35.3 m
- d) 45.3 m

**27. The metacentric height of a ship is 0.6 m and the radius of gyration is 4 m. The time of rolling of a ship is**

- a) 4.1 s
- b) 5.2 s
- c) 10.4 s
- d) 14.1 s

**28. The imaginary line drawn in the fluid in such a way that the tangent to any point gives the direction of motion at that point, is known as**

- a) path line
- b) stream line
- c) steak line
- d) potential line

**29. The Cippoletti weir is a \_\_\_\_\_ weir.**

- a) rectangular
- b) triangular
- c) trapezoidal
- d) circular

**30. When a body is placed over a liquid, it will float if**

- a) gravitational force is equal to the upthrust of the liquid
- b) gravitational force is less than the upthrust of the liquid
- c) gravitational force is more than the upthrust of the liquid
- d) none of the above

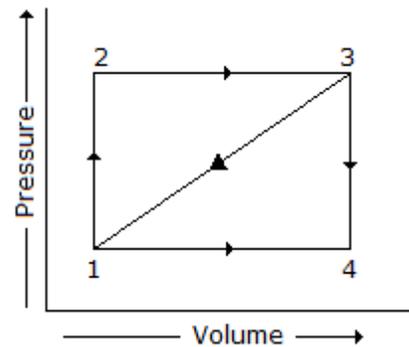
**31. A definite area or a space where some thermodynamic process takes place is known as**

- a) thermodynamic system
- b) thermodynamic cycle
- c) thermodynamic process
- d) thermodynamic law

**32. The universal gas constant (or molar constant) of a gas is the product of**

- a) molecular mass of the gas and the gas constant
- b) atomic mass of the gas and the gas constant
- c) molecular mass of the gas and the specific heat at constant pressure
- d) molecular mass of the gas and the specific heat at constant volume

**33. A path 1-2-3 is given. A system absorbs 100 kJ as heat and does 60 kJ of work while along the path 1-4-3, it does 20 kJ of work. The heat absorbed during the cycle 1-4-3 is**



- a) -140 kJ
- b) -80 kJ
- c) -40 kJ
- d) +60 kJ

**34. When gas is heated at constant pressure, the heat supplied is utilized in**

- a) increasing the internal energy of gas
- b) doing some external work
- c) increasing the internal energy of gas and also for doing some external work
- d) none of the above

**35. The heating of a gas at constant pressure is governed by**

- a) Boyle's law
- b) Charles' law
- c) Gay-Lussac law
- d) Avogadro's law

36. The heat energy stored in the gas and used for raising the temperature of the gas is known as

- a) external energy
- b) internal energy
- c) kinetic energy
- d) molecular energy

37. The fuel mostly used in blast furnace for extracting pig iron from iron ores is

- a) hard coke
- b) soft coke
- c) pulverised coal
- d) bituminous coal

38. Which of the following statement is correct?

- a) The heat and work are boundary phenomena
- b) The heat and work represent the energy crossing the boundary of the system
- c) The heat and work are path functions
- d) all of the above

39. Relation between  $c_p$  and  $c_v$  is given by (where  $c_p$  = Specific heat at constant pressure,  $c_v$  = Specific heat at constant volume,  $\gamma = c_p/c_v$ , known as adiabatic index, and  $R$  = Gas constant)

a)  $\frac{c_v}{c_p} = R$

b)  $c_p - c_v = R$

c)  $c_v = \frac{R}{(\gamma - 1)}$

d) Both (B) and (C)

40. The polytropic index ( $n$ ) is given by

a)  $\frac{\log(p_1/p_2)}{\log(v_1/v_2)}$

b)  $\frac{\log(p_2/p_1)}{\log(v_1/v_2)}$

c)  $\frac{\log(v_1/v_2)}{\log(p_1/p_2)}$

d)  $\log\left(\frac{p_1 v_1}{p_2 v_2}\right)$

41. The temperature at which the volume of a gas becomes zero is called

- a) absolute scale of temperature
- b) absolute zero temperature

- c) absolute temperature
- d) none of these

42. The entropy of water at  $0^\circ\text{C}$  is assumed to be

- a) 1
- b) 0
- c) -1
- d) 10

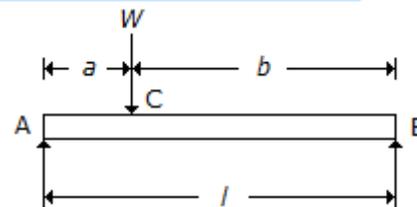
43. Two beams, one of circular cross-section and the other of square cross-section, have equal areas of cross-sections. When these beams are subjected to bending,

- a) both beams are equally economical
- b) square beam is more economical
- c) circular beam is more economical
- d) none of these

44. When a body is subjected to a direct tensile stress ( $\sigma$ ) in one plane, then maximum normal stress occurs at a section inclined at \_\_\_\_\_ to the normal of the section.

- a)  $0^\circ$
- b)  $30^\circ$
- c)  $45^\circ$
- d)  $90^\circ$

45. For a beam, as shown in the below figure, the deflection at C is (where  $E$  = Young's modulus for the beam material, and  $I$  = Moment of inertia of the beam section.)



a)  $\frac{Wl^3}{48 EI}$

b)  $\frac{Wa^2b^2}{3 EI}$

c)  $\frac{Wa}{a\sqrt{3} EI} (l^2 - a^2)^{3/2}$

d)  $\frac{5 Wl^3}{384 EI}$

46. A closely-coiled helical spring of stiffness  $k$  is cut into  $(n)$  equal parts. The stiffness in each part of the spring will be

- a)  $kn$
- b)  $nk$
- c)  $nk$
- d)  $nk^2$

47. The shear modulus of most materials with respect to the modulus of elasticity is

- a) equal to half
- b) less than half
- c) more than half
- d) none of these.

48. The limit of eccentricity for no tensile conditions for a column of circular section of diameter  $(d)$  is

- a)  $d/4$
- b)  $d/8$
- c)  $d/12$
- d)  $d/16$

49. The acceleration of a particle at any instant has two components i.e. radial component and tangential component. These two components will be

- a) parallel to each other
- b) perpendicular to each other
- c) inclined at  $45^\circ$
- d) opposite to each other

50. 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

- 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) none of the above

51. The secondary unbalanced force is maximum \_\_\_\_\_ in one revolution of the crank.

- a) two times
- b) four times
- c) eight times
- d) sixteen times

52. A spring controlled governor is found unstable. It can be made stable by

- a) increasing the spring stiffness
- b) decreasing the spring stiffness
- c) increasing the ball mass
- d) decreasing the ball mass

53. A watt's governor can work satisfactorily at speeds from

- a) 60 to 80 r.p.m.
- b) 80 to 100 r.p.m.
- c) 100 to 200 r.p.m.
- d) 200 to 300 r.p.m.

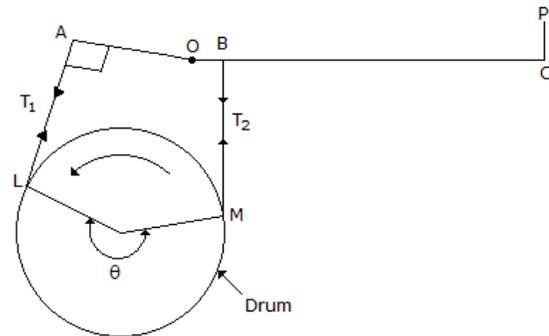
54. When one of the links of a kinematic chain is fixed, the chain is known as a

- a) structure
- b) mechanism
- c) inversion
- d) machine

55. A Porter governor is a

- a) pendulum type governor
- b) dead weight governor
- c) spring loaded governor
- d) inertia governor

56. For the brake to be self locking, the force  $P$  at C shown in the below figure, should



- a) be zero
- b) act in upward direction
- c) act in downward direction
- d) none of these

57. The cam follower generally used in aircraft engines is

- a) knife edge follower
- b) flat faced follower
- c) spherical faced follower
- d) roller follower

58. 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

59. The example of completely constrained motion is a

- a) motion of a piston in the cylinder of a steam engine
- b) motion of a square bar in a square hole

- c) .motion of a shaft with collars at each end in a circular hole  
d) all of the above

**60. In involute gears, the pressure angle is**

- a) dependent on the size of teeth  
b) dependent on the size of gears  
c) always constant  
d) always variable

**61. A shaft carrying three rotors will have**

- a) no node  
b) one node  
c) two nodes  
d) three nodes

**62. The minimum force required to slide a body of weight W on a rough horizontal plane is**

- a)  $W \sin \theta$   
b)  $W \cos \theta$   
c)  $W \tan \theta$   
d)  $W \operatorname{cosec} \theta$

**63. Which of the following statement is correct for gears ?**

- a) The addendum is less than the dedendum  
b) The pitch circle diameter is the product of module and number of teeth  
c) The contact ratio means the number of pairs of teeth in contact  
d) all of the above

**64. The minimum number of teeth on the pinion which will mesh with any gear without interference for  $20^\circ$  full depth involute teeth will be**

- a) 12  
b) 14  
c) 18  
d) 24

**65. In a screw jack, the effort required to lift the load W is given by (where  $\alpha$  = Helix angle, and  $\phi$  = Angle of friction)**

- a)  $P = W \tan(\alpha - \phi)$   
b)  $P = W \tan(\alpha + \phi)$   
c)  $P = W \tan(\phi - \alpha)$   
d)  $P = W \cos(\alpha + \phi)$

**66. In order to facilitate starting of locomotive in any position, the cranks of a locomotive with two cylinders, are placed at**

- a)  $45^\circ$  to each other  
b)  $90^\circ$  to each other  
c)  $120^\circ$  to each other  
d)  $180^\circ$  to each other

**67. The coriolis component of acceleration leads the sliding velocity by**

- a)  $45^\circ$   
b)  $90^\circ$   
c)  $135^\circ$   
d)  $180^\circ$

**68. Tin base white metals are used where the bearings are subjected to**

- a) large surface wear  
b) elevated temperatures  
c) light load and pressure  
d) high pressure and load

**69. The charge of the blast furnace consists of**

- a) calcined ore (8 parts), coke (4 parts) and limestone (1 part)  
b) calcined ore (4 parts), coke (1 part) and limestone (8 parts)  
c) calcined ore (1 part), coke (8 part) and limestone (4 parts)  
d) calcined ore, coke and limestone all in equal parts

**70. The ability of a material to resist fracture due to high impact loads, is called**

- a) strength  
b) stiffness  
c) toughness  
d) brittleness

**71. The purpose of heat treatment is to**

- a) relieve the stresses set up in the material after hot or cold working  
b) modify the structure of the material  
c) change grain size  
d) any one of these

**72. An alloy of copper, tin and zinc is known as**

- a) brass  
b) bronze  
c) gun metal  
d) muntz metal

**73. Which of the following iron exist between  $910^\circ \text{C}$  and  $1403^\circ \text{C}$ ?**

- a)  $\alpha$ -iron  
b)  $\beta$ -iron  
c)  $\gamma$ -iron  
d)  $\delta$ -iron

**74. The material in which the atoms are arranged chaotically, is called**

- a) amorphous material  
b) mesomorphous material  
c) crystalline material  
d) none of these

**75. In basic Bessemer process, the furnace is lined with**

- a) silica bricks
- b) a mixture of tar and burnt dolomite bricks
- c) either (a) or (b)
- d) none of these

**76. Shock resistance of steel is increased by adding**

- a) nickel
- b) chromium
- c) nickel and chromium
- d) sulphur, lead and phosphorus

**77. In low carbon steels, \_\_\_\_\_ raises the yield point and improves the resistance to atmospheric corrosion.**

- a) sulphur
- b) phosphorus
- c) manganese
- d) silicon

**78. A steel containing 16 to 18% chromium and about 0.12% carbon is called**

- a) ferritic stainless steel
- b) austenitic stainless steel
- c) martensitic stainless steel
- d) nickel steel

**79. The alloy, mainly used for corrosion resistance in stainless steels is**

- a) silicon
- b) manganese
- c) carbon
- d) chromium

**80. The temperature required for full annealing in hyper-eutectoid steel is**

- a) 30° C to 50° C above upper critical temperature
- b) 30° C to 50° C below upper critical temperature
- c) 30° C to 50° C above lower critical temperature
- d) 30° C to 50° C below lower critical temperature

**81. Which of the following metal shrinks most from molten state to solid state?**

- a) Cast iron
- b) Cast steel
- c) Brass
- d) Admiralty metal

**82. A steel containing ferrite and pearlite is**

- a) hard
- b) soft
- c) tough

d) hard and tough

**83. The defect which takes place due to imperfect packing of atoms during recrystallization is known as**

- a) line defect
- b) surface defect
- c) point defect
- d) none of these

**84. A coarse grained steel**

- a) is less tough and has a greater tendency to distort during heat treatment
- b) is more ductile and has a less tendency to distort during heat treatment
- c) is less tough and has a less tendency to distort during heat treatment
- d) is more ductile and has a greater tendency to distort during heat treatment

**85. Age hardening is related to**

- a) duralumin
- b) brass
- c) copper
- d) silver

**86. The addition of which of the following improves machining of copper?**

- a) Sulphur
- b) Vanadium
- c) Tin
- d) Zinc

**87. When a medium carbon steel is heated to coarsening temperature,**

- a) there is no change in grain size
- b) the average grain size is a minimum
- c) the grain size increases very rapidly
- d) the grain size first increases and then decreases very rapidly

**88. The bond formed by transferring electrons from one atom to another is called**

- a) ionic bond
- b) covalent bond
- c) metallic bond
- d) none of these

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

- a) Strength
- b) Stiffness
- c) Brittleness
- d) Toughness

**90. German silver contains**

- a) 1% silver
- b) 2% silver

- c) 5% silver
- d) no silver

**91. Connecting rod is, usually, made from**

- a) low carbon steel
- b) high carbon steel
- c) medium carbon steel
- d) high speed steel

**92. Which of the following impurity in cast iron makes it hard and brittle?**

- a) Silicon
- b) Sulphur
- c) Manganese
- d) Phosphorus

**93. The lathe centres are provided with standard taper known as**

- a) Morse taper
- b) Seller's taper
- c) Chapman taper
- d) Brown and Sharpe taper

**94. In a plain milling cutter, the portion of the gash adjacent to the cutting edge on which the chip impinges is called**

- a) face
- b) fillet
- c) land
- d) lead

**95. The grooving is an operation of**

- a) . bevelling the extreme end of a workpiece
- b) . embossing a diamond shaped pattern on the surface of a workpiece
- c) reducing the diameter of a workpiece over a very narrow surface
- d) enlarging the end of a hole cylindrically.

**96. Cutting fluids are used to**

- a) cool the tool
- b) improve surface finish
- c) cool the workpiece
- d) all of these

**97. The structure of a grinding wheel depends upon**

- a) hardness of the material being ground
- b) nature of the grinding operation
- c) finish required
- d) all of these

**98. Tool life is generally better when**

- a) grain size of the metal is large
- b) grain size of the metal is small
- c) hard constituents are present in the microstructure of the tool material
- d) none of the above

**99. When the metal is removed by erosion caused by rapidly recurring spark discharges between the tool and work, the process is known as**

- a) electro-chemical machining
- b) electro-discharge machining
- c) ultra-sonic machining
- d) none of these

**100. Which of the following statement is wrong as regard to down milling?**

- a) It can not be used on old machines due to backlash between the feed screw of the table and the nut.
- b) The chips are disposed off easily and do not interfere with the cutting.
- c) The surface milled appears to be slightly wavy.
- d) The coolant can be poured directly at the cutting zone where the cutting force is maximum.

**101. In reaming process**

- a) metal removal rate is high
- b) high surface finish is obtained
- c) high form accuracy is obtained
- d) high dimensional accuracy is obtained

**102. The cutting angle of a flat drill varies from**

- a) 3° to 8°
- b) 20° to 30°
- c) 60° to 90°
- d) 90° to 120°

**103. In electro-discharge machining, dielectric is used to**

- a) help in the movement of the sparks
- b) control the spark discharges
- c) act as coolant
- d) all of these

**104. In metal cutting operations, the shear angle is the angle made by the shear plane with the**

- a) direction of the tool axis
- b) direction of tool travel
- c) perpendicular to the direction of the tool axis
- d) central plane of the workpiece

**105. The floating position of the holding fixture in a rotary transfer device is used to**

- a) improve the accuracy of location
- b) reduce the tendency to over-index
- c) improve upon the acceleration and deceleration characteristics
- d) . reduce the cycle time

**106. The operation of smoothing and squaring the surface around a hole is known**

- a) counter-sinking
- b) counter-boring
- c) trepanning
- d) spot facing

**107. Discontinuous chips are formed during machining of**

- a) brittle metals
- b) ductile metals
- c) hard metals
- d) soft metals

**108. A drill mainly used in drilling brass, copper or softer materials, is**

- a) flat drill
- b) straight fluted drill
- c) parallel shank twist drill
- d) tapered shank twist drill

**109. In a planer**

- a) tool is stationary and work reciprocates
- b) work is stationary and tool reciprocates
- c) tool moves over stationary work
- d) tool moves over reciprocating work

**110. Which of the following operation is first performed?**

- a) Spot facing
- b) Boring
- c) Tapping
- d) Drilling

**111. The size of a lathe is specified by the**

- a) length between centres
- b) swing diameter over the bed
- c) swing diameter over the carriage
- d) all of these

**112. If the cutting speed is increased, then the built-up-edge**

- a) becomes longer
- b) may or may not form
- c) becomes smaller and finally does not form at all
- d) has nothing to do with speed

**113. For machining a mild steel workpiece by a high speed steel tool, the average cutting speed is**

- A. 5 m/min
- B. 10 m/min
- C. 15 m/min
- D. 30 m/min

**114. Tool signature consists of \_\_\_\_\_ elements.**

- a) two
- b) four
- c) five
- d) seven

**115. The negative rake is usually provided on**

- a) high carbon steel tools
- b) high speed steel tools
- c) cemented carbide tools
- d) all of these

**116. The tool life is affected by**

- a) depth of cut
- b) cutting speed
- c) feed
- d) all of these

**117. The flow through a nozzle is regarded as**

- a) constant volume flow
- b) constant pressure flow
- c) isothermal flow
- d) isentropic flow

**118. The ratio of total useful heat drop to the total isentropic heat drop, is called**

- a) stage efficiency
- b) internal efficiency
- c) Rankine efficiency
- d) none of these

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

- a) inlet and throat
- b) inlet and outlet
- c) throat and exit
- d) all of these

**120. The steam leaves the nozzle at a**

- a) high pressure and a low velocity
- b) high pressure and a high velocity
- c) low pressure and a low velocity
- d) low pressure and a high velocity

## GENERAL APTITUDE/ AWARENESS

**121. During one year, the population of a locality increases by 5% but during the next year, it decreases by 5%. If the population at the end of the second year was 7980, find the population at the beginning of the first year.**

- (a) 7500
- (b) 8000
- (c) 9500
- (d) 6500

**122.** The population of a town is 8000. If the males increase by 6% and the females by 10%, the population will be 8600. Find the number of females in the town.

- (a) 5000
- (b) 2000
- (c) 3000
- (d) 1500

**123.** The mean temperature from the 9th to the 16th January, both days inclusive, was  $11.6^{\circ}\text{C}$  and from the 10th to the 17th it was  $12.2^{\circ}\text{C}$ . the temperature on the 9th was  $10.8^{\circ}\text{C}$ . What was it on the 17th?

- (a)  $15.6^{\circ}\text{C}$
- (b)  $4.8^{\circ}\text{C}$
- (c)  $9.6^{\circ}\text{C}$
- (d)  $15^{\circ}\text{C}$

**124.** The average of marks obtained by 120 candidates in a certain examination is 35. If the average marks of passed candidates is 39 and that of the failed candidates is 15, what is the number of candidates who passed examination?

- (a) 100
- (b) 200
- (c) 300
- (d) 400

**125.** A person divides his total route of journey into three equal parts and decides to travel the three parts with speeds of 40, 30 and 15 km/hr respectively. Find his average speed during the whole journey.

- (a) 22
- (b) 24
- (c) 34
- (d) 44

**126.** The average weight of a group of 15 boys was calculated to be 60 kg and it was later discovered that one weight was misread as 24 kg instead of the correct one of 42 kg. The correct average weight is?

- (a) 60.2 kg
- (b) 61.2 kg
- (c) 62 kg
- (d) 61 kg

**127.** The population of a town increased by 20% during the first year, by 25% during the next year and by 44% during the third year. Find the average rate of increase during 3 years.

- (a) 36.87%

- (b) 37.68%
- (c) 38.67%
- (d) 31.17%

**128.** Ten years ago Mohan was thrice as old as Ram was but 10 years hence, he will be only twice as old as Ram. Find Mohan's present age.

- (a) 72 years
- (b) 70 years
- (c) 30 years
- (d) Cannot be determined

**129.** The sum of the age of a vineet and a roshan is 56 years. Also, 4 years ago, the roshan age was 3 times the age of the vinnet. The present ages of the vineet :

- (a) 15
- (b) 16
- (c) 17
- (d) 18

**130.** In a certain store, the profit is 320% of the cost price. If the cost increases by 25% but the selling price remains constant, approximately what percentage of the selling price is the profit?

- a) 30%
- b) 70%
- c) 100%
- d) 250%

**131.** A vendor bought toffees at 6 for a rupee. How many for a rupee must he sell to gain 20%?

- a) 3
- b) 4
- c) 5
- d) 6

**132.** The percentage profit earned by selling an article for Rs. 1920 is equal to the percentage loss incurred by selling the same article for Rs. 1280. At what price should the article be sold to make 25% profit?

- a).Rs. 2000
- b).Rs. 2200
- c).Rs. 2400
- d).Rs. 3400

**133.** A person incurs a loss of 5% by selling a watch for Rs. 1140. At what price should the watch be sold to earn 5% profit.

- a).Rs.1200
- b).Rs.1230
- c).Rs.1260
- d).Rs.1290

134. The relative speed of a train in respect of a car is 90 km/h when train and car are moving opposite to each other. Find the actual speed of train, if car is moving with a speed of 15 km/h.

- (a) 80 km/h
- (b) 105 km/h
- (c) 75 km/h
- (d) 100 km/h

135. A sum of money amounts to Rs. 5200 in 5 years and to Rs. 5680 in 7 years at simple interest. The rate of interest per annum is:

- (a) 3%
- (b) 4%
- (c) 5%
- (d) 6%

136. Simple interest on a certain sum at a certain annual rate of interest is  $\frac{25}{16}$  of the sum. If the rate percent per annum and time in years be equal, then rate percent per annum is:

- (a) 8%
- (b)  $11\frac{1}{2}\%$
- (c)  $12\frac{1}{2}\%$
- (d)  $12\frac{1}{4}\%$

137. A certain sum of money becomes three times of itself in 20 years at simple interest. In how many years does it become double of itself at the same rate?

- (a) 8 years
- (b) 10 years
- (c) 12 years
- (d) 14 years

138. The sum of two numbers is 528 and their H.C.F is 33. What is the number of pairs of such numbers?

- (a) 4
- (b) 12
- (c) 8
- (d) 6

139. Indian Railways set to launch its first \_\_\_\_\_ Express train with Wi-Fi, entertainment screens, and vending machines for passengers.

- a). Howrah Express
- b). Tanjore Express
- c). Tejas Express
- d). Delhi Express

140. The central government has informed the Supreme Court to provide unique identification number for which animal?

- a) Cow
- b) Goat
- c) Horse
- d) Dog

141. Who wrote 'War and Peace'?

- a) Leo Tolstoy
- b) Mahatma Gandhi
- c) Charles Dickens
- d) Kipling

142. Garampani sanctuary is located at

- a) Junagarh, Gujarat
- b) Diphu, Assam
- c) Kohima, Nagaland
- d) Gangtok, Sikkim

143. Brass gets discoloured in air because of the presence of which of the following gases in air?

- a) Oxygen
- b) Hydrogen sulphide
- c) Carbon dioxide
- d) Nitrogen

144. Which of the following is a non metal that remains liquid at room temperature?

- a) Phosphorous
- b) Bromine
- c) Chlorine
- d) Helium

145. Chlorophyll is a naturally occurring chelate compound in which central metal is

- a) copper
- b) magnesium
- c) iron
- d) calcium

146. Fathom is the unit of

- a) sound
- b) depth
- c) frequency
- d) distance

147. The president addresses both the Houses of Parliament assembled together

- a) during emergency session summoned for the purpose
- b) every session
- c) first session after each general election and the first session of each year
- d) any session

# **ENGINEERING ACADEMY DEHRADUN**

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**MOB: 08449597123, 09411340612**

**Prep By: Rahul Kothiyal**

**148. The president can dissolve the Lok Sabha on**

- a) advice of the prime minister
- b) advice of the chief justice of India
- c) recommendation of Lok Sabha
- d) recommendation of the Rajya Sabha

**149. Who was the first Indian to win the World Amateur Billiards title?**

- a) Geet Sethi
- b) Wilson Jones
- c) Michael Ferreira
- d) Manoj Kothari

**150. Who was the 1st ODI captain for India?**

- a) Ajit Wadekar
- b) Bishen Singh Bedi
- c) Nawab Pataudi
- d) Vinoo Mankad

**151. Which of the following dances is a solo dance?**

- a) Ottan Thullal
- b) Kuchipudi
- c) Yakshagana
- d) Odissi

**152. The National Anthem was first sung in the year**

- a) 1911
- b) 1913
- c) 1936
- d) 1935

**153. Find the greatest number that will divide 43, 91 and 183 so as to leave the same remainder in each case.**

- a) 4
- b) 7
- c) 9
- d) 13

**154. The H.C.F. of two numbers is 23 and the other two factors of their L.C.M. are 13 and**

**14. The larger of the two numbers is:**

- a) 276
- b) 299
- c) 322
- d) 345

**155. Six bells commence tolling together and toll at intervals of 2, 4, 6, 8, 10 and 12 seconds respectively. In 30 minutes, how many times do they toll together ?**

- a) 4
- b) 10
- c) 15
- d) 16

**156. Find the odd man out.**

**396, 462, 572, 427, 671, 264**

- a) 396
- b) 427
- c) 671
- d) 264

**157. The angle of elevation of a ladder leaning against a wall is  $60^\circ$  and the foot of the ladder is 4.6 m away from the wall. The length of the ladder is:**

- a) 2.3 m
- b) 4.6 m
- c) 7.8 m
- d) 9.2 m

**158. Siphon will fail to work if**

- a) the densities of the liquid in the two vessels are equal
- b) the level of the liquid in the two vessels are at the same height
- c) both its limbs are of unequal length
- d) the temperature of the liquids in the two vessels are the same

**159. Nuclear sizes are expressed in a unit named**

- a) Fermi
- b) angstrom
- c) newton
- d) tesla

**160. Radio telescopes are better than optical telescopes because**

- a) they can detect faint galaxies which no optical telescope can
- b) they can work even in cloudy conditions
- c) they can work during the day and night
- d) All of the above

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## **ANSWER KEY**

Q	A	Q	A	Q	A
1	d	28	b	55	b
2	d	29	c	56	a
3	d	30	b	57	d
4	c	31	a	58	c
5	a	32	a	59	d
6	d	33	d	60	c
7	d	34	c	61	c
8	c	35	b	62	a
9	c	36	b	63	d
10	d	37	a	64	c
11	a	38	d	65	b
12	c	39	d	66	b
13	c	40	b	67	b
14	a	41	b	68	a
15	d	42	b	69	a
16	d	43	b	70	c
17	c	44	a	71	d
18	d	45	b	72	c
19	d	46	c	73	c
20	c	47	b	74	a
21	d	48	b	75	b
22	c	49	b	76	c
23	d	50	a	77	b
24	b	51	b	78	a
25	c	52	b	79	d
26	a	53	a	80	c
27	c	54	b	81	d

Q	A	Q	A	Q	A
82	b	109	a	136	c
83	c	110	b	137	b
84	a	111	d	138	a
85	a	112	c	139	c
86	a	113	d	140	a
87	c	114	d	141	a
88	a	115	c	142	b
89	d	116	d	143	b
90	d	117	d	144	b
91	c	118	b	145	b
92	b	119	c	146	b
93	a	120	d	147	c
94	a	121	b	148	a
95	c	122	c	149	b
96	d	123	a	150	a
97	d	124	a	151	a
98	a	125	b	152	a
99	b	126	b	153	a
100	c	127	c	154	c
101	c	128	b	155	d
102	d	129	b	156	b
103	d	130	b	157	d
104	b	131	c	158	b
105	d	132	a	159	a
106	d	133	c	160	d
107	a	134	c		
108	b	135	d		