

077/2016

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. The ratio of mass to volume is known as :  
(A) Specific weight (B) Density  
(C) Specific volume (D) None of the above
2. Density of mercury is 13.6 g/cc and density of water is 1 gr/cc, then specific gravity of mercury is :  
(A) 13.6 gr/cc (B) 1 gr/cc  
(C) 13.6 (D) 1
3. The pressure acting at the bottom of a 1 m deep tank having fresh water with density 1000 kg/m<sup>3</sup> :  
(A) 1000 Pa (B) 1 Pa  
(C) 981 Pa (D) 9810 Pa
4. The spherical shape of droplets of Mercury is due to :  
(A) High surface tension (B) High density  
(C) High adhesion (D) Low vapour pressure
5. The capillary rise or dipression in a small diameter tube is :  
(A) Directly proportional to the diameter  
(B) Inversely proportional to surface tension  
(C) Directly proportional to the surface tension  
(D) Inversely proportional to diameter
6. Gauge pressure in flow systems are measured by :  
(A) Manometer (B) Aneroid barometer  
(C) Vacuum Gauge (D) Bourdon Gauge
7. Standard atmospheric pressure in terms of water column is :  
(A) 9.81 m (B) 8.75 m  
(C) 12.35 m (D) 10.33 m

8. The velocity head representing the kinetic energy per unit weight of fluid is denoted by :
- (A)  $v^2$  (B)  $\frac{v^2}{2g}$   
 (C)  $\frac{v^2}{2}$  (D)  $\sqrt{2gh}$
9. A Pitot tube is an instrument for measuring :
- (A) Pressure of flow (B) Discharge of fluid  
 (C) Velocity of flow (D) Total energy
10. Venturi meter is a device used for measuring :
- (A) Flow rate (B) Piezo metric head  
 (C) Velocity head (D) Pressure
11. The laminar flow is characterized by :
- (A) Irregular motion of fluid particle  
 (B) Fluid particles moving in layers parallel to the boundary surface  
 (C) Existence of eddies  
 (D) High Renold's number of flow
12. The essential feature of turbulent flow :
- (A) Large discharge  
 (B) High discharge  
 (C) Velocity at a point remains constant with time  
 (D) Velocity and pressure at a point exhibits irregular fluctuations of high frequency
13. The energy loss in a pipe line is due to :
- (A) Viscous action only  
 (B) Surface roughness only  
 (C) Friction offered by pipe wall as well as by the viscous action  
 (D) Turbulent shear stress alone
14. Head loss due to sudden expansion is given by :
- (A)  $\frac{(v_1 - v_2)^2}{2g}$  (B)  $\frac{(v_1 - v_2)^3}{2g}$   
 (C)  $\frac{v_1^2 - v_2^2}{2g}$  (D)  $\frac{2(v_1^2 - v_2^2)}{g}$

15. The coefficient of discharge  $C_d$  in terms of  $C_v$  and  $C_c$  :

(A)  $C_d = \frac{C_v}{C_c}$

(B)  $C_d = C_v \times C_c$

(C)  $C_d = \frac{C_c}{C_v}$

(D) None of the above

16. The discharge through a rectangular notch is given by :

(A)  $Q = \frac{2}{3} C_d L \sqrt{2g} H^{5/2}$

(B)  $Q = \frac{8}{15} C_d \sqrt{2g} LH^{3/2}$

(C)  $Q = \frac{8}{15} C_d \sqrt{2g} LH^{5/2}$

(D)  $Q = \frac{2}{3} C_d \sqrt{2g} LH^{3/2}$

17. The loss of pressure head for laminar flow through pipe varies :

(A) As the square of velocity

(B) Directly as the velocity

(C) As the inverse of velocity

(D) None of the above

18. Stoke is the unit of :

(A) Surface tension

(B) Viscosity

(C) Kinematic viscosity

(D) Capillarity

19. Gauge pressure at a point is equal to :

(A) Absolute pressure minus atmospheric pressure

(B) Absolute pressure plus atmospheric pressure

(C) Vacuum pressure plus absolute pressure

(D) Vacuum pressure minus atmospheric pressure

20. Bernoulli's theorem deals with the law of conservation of :

(A) Mass

(B) Momentum

(C) Density

(D) Energy

21. The unit of frequency of an alternating quantity :

(A) Watt

(B) Hertz

(C) Seconds

(D) rpm

22. rms value of symmetrical sinusoidal current is :

(A) 0.707 max : value

(B) 0.637 max : value

(C) 0.5 max : value

(D) 0.75 max : value

23. The power factor of an R-L series circuit is :

(A) Zero

(B) Between 0 and 1

(C) Between 0 and -1

(D) 1

24. The power taken by a  $3\phi$  load is given by :
- (A)  $3V_L I_L \cos \phi$  (B)  $3V_L I_L \sin \phi$   
(C)  $\sqrt{3}V_L I_L \sin \phi$  (D)  $\sqrt{3}V_L I_L \cos \phi$
25. The function of a commutator in a d.c. generator is to :
- (A) Convert induced a.c. into d.c. (B) Convert induced d.c. into a.c.  
(C) Reduce spark at brushes (D) Reduce the power factor
26. The best suited motor for cranes and hoists :
- (A) d.c. shunt motor (B) d.c. compound motor  
(C) d.c. series motor (D) cumulative-compound motor
27. During charging of lead acid cell :
- (A) Its cathode become dark chocolate brown in colour  
(B) Its voltage increases  
(C) It gives out energy  
(D) Specific gravity of  $H_2SO_4$  is decreased
28. The ratio of Ah efficiency to Wh efficiency of lead acid cell is :
- (A) Always less than 1 (B) Equal to 1  
(C) Equal to 0.5 (D) Always greater than 1
29. The capacity of a cell is measured in :
- (A) Watt hour (B) Watts  
(C) Ampere hour (D) Ampere
30. The sulphation in a lead acid battery occurs due to :
- (A) Trickle charging (B) Incomplete charging  
(C) Heavy discharging (D) Fast discharging
31. The working cycle of a petrol engine :
- (A) Otto cycle (B) Rankine cycle  
(C) Carnot cycle (D) Diesel cycle
32. Which engine is suitable for heavy load?
- (A) Diesel engine (B) Petrol engine  
(C) Dual combustion engine (D) LPG engine

33. How many number of working stroke per minute will take place for a 1600 rpm single cylinder 4 stroke engine?  
 (A) 1600 (B) 3200  
 (C) 400 (D) 800
34. Cooling system used for two stroke petrol engine :  
 (A) Water cooled (B) Air cooled  
 (C) Oil cooled (D) Regenerative cooled
35. The function of carburettor in petrol engine :  
 (A) To distribute fuel to different cylinders  
 (B) To inject the fuel into engine cylinder  
 (C) To mix air and petrol into correct proportion  
 (D) To give spark at correct time
36. The brake power is 7.5 kw and frictional power is 2.5 kw, then the indicated power is :  
 (A) 2.5 kw (B) 5 kw  
 (C) 7.5 kw (D) 10 kw
37. The Heat addition process in a diesel engine takes place at :  
 (A) Constant pressure  
 (B) Partially constant : pressure and partially constant volume  
 (C) Constant volume  
 (D) Constant temperature
38. In a 4 stroke, each cylinder has :  
 (A) Four valve (B) Three valve  
 (C) Two valve (D) One valve
39. The component that atomise fuel into fine spray to cylinder :  
 (A) Injection pump (B) fuel feed pump  
 (C) Carburettor (D) Injection nozzle
40. Stoichio metric air fuel ratio :  
 (A) 20:1 (B) 15:1  
 (C) 12:1 (D) 8:1
41. When pressing the clutch pedal?  
 (A) Pressure plate comes to rest  
 (B) Connect the fly wheel with gear box permanently  
 (C) Pressure plate moves away from fly wheel  
 (D) Pressure plate moves towards the fly wheel

42. The device which permits the vehicle reverse direction :  
(A) Clutch (B) Gear box  
(C) Fly wheel (D) Differential
43. Which type of rear axle is used for heavy commercial vehicle?  
(A) Quarter floating (B) Semi floating  
(C) Three quarter floating (D) Full floating
44. In air brake system air compressor is driven by :  
(A) Engine itself (B) Electric motor  
(C) Hand operated (D) Battery
45. The principle used for making hydraulic brakes :  
(A) Darcy's Law (B) Bernoulli's Law  
(C) Chezy's Law (D) Pascals' Law
46. One tonne of refrigeration is equal to :  
(A) 21 KJ/min (B) 210 KJ/min  
(C) 420 KJ/min (D) 620 KJ/min
47. C.O.P is always \_\_\_\_\_ one.  
(A) Equal to (B) Less than  
(C) Greater than (D) None of the above
48. In a refrigerating machine, heat rejected is \_\_\_\_\_ heat absorbed.  
(A) Greater than (B) Equal to  
(C) Less than (D) None of the above
49. Heat is rejected by the refrigerant in \_\_\_\_\_ during refrigerating cycle.  
(A) Expansion valve (B) Compressor  
(C) Condenser (D) Evaporator
50. Commonly used refrigerant in a domestic vapour compression refrigerator :  
(A) CO<sub>2</sub> (B) Freon - 12  
(C) Ammonia (D) SO<sub>2</sub>
51. In a vapour compression refrigeration system, the condition for refrigerant before entering the compressor :  
(A) Super heated vapour (B) Wet vapour  
(C) Saturated liquid (D) Subcooled liquid

52. The refrigerant commonly used in vapour absorption system is :  
(A) Water (B) Freon 12  
(C) SO<sub>2</sub> (D) Aqua-ammonia
53. A electrolux refrigerator is called :  
(A) Single fluid absorption system  
(B) Two fluid absorption system  
(C) Three fluid absorption system  
(D) Four fluid absorption system
54. Identify the azeotrope refrigerant from the following :  
(A) R-11 (B) R-40  
(C) R114 (D) R502
55. Highly toxic and flammable refrigerant :  
(A) Carbon dioxide (B) Ammonia  
(C) Air (D) R-12
56. Environmental protection agencies advice against the use of chloro-fluro carbon refrigerant because :  
(A) These react with water and cause acid rain  
(B) These reacts with plants and cause green house effect  
(C) These reacts with oxygen and cause its depletion  
(D) These reacts with ozone layer
57. The expansion device used in domestic refrigerator :  
(A) Capillary tube  
(B) Float valve  
(C) Hand operated expansion valve  
(D) Automatic expansion valve
58. In summer A/C, the air is :  
(A) Cooled and humidified  
(B) Heated and humidified  
(C) Cooled and dehumidified  
(D) Heated and dehumidified
59. When heat is absorbed by a gas, change in entropy is considered to be :  
(A) Positive (B) Zero  
(C) Negative (D) One

60. The COP of a Bell-Coleman cycle refrigerators having same compression ratio and expansion ratio ( $\gamma_p =$  compression ratio = expansion ratio)

(A)  $\left(\frac{1}{\gamma_p}\right)^{\frac{r-1}{r}}$

(B)  $\frac{1}{\gamma_p^{\frac{r-1}{r}} - 1}$

(C)  $\gamma_p^{\frac{r-1}{r}} - 1$

(D)  $(\gamma_p - 1)^{\frac{r-1}{r}}$

61. The tail stock set over for a job having  $D = 35$  mm  $d = 27$  mm  $l = 75$  mm and  $L = 225$  mm would be equal to :

(A) 4 mm

(B) 10 mm

(C) 12 mm

(D) 15 mm

62. The cutting tool in a milling machine is held in position by :

(A) Arbor

(B) Spindle

(C) Column

(D) Knee

63. Which of the following operation is required for making a chamfer on the edge of a hole?

(A) Spot facing

(B) Facing

(C) Reaming

(D) Counter sinking

64. Which of the following welding processes used consumable electrode?

(A) Submerged welding

(B) MIG welding

(C) TIG welding

(D) CIG welding

65. The heat generated in resistance welding is given by :

(A)  $H = \frac{I^2 R}{T}$

(B)  $H = \frac{I^2 T}{R}$

(C)  $H = I^2 RT$

(D)  $H = \frac{RT}{I^2}$

66. The process of joining two pieces in which a nonferrous alloy is introduced in liquid state between the pieces of metals and allowed to solidify, is known as :

(A) welding

(B) Riveting

(C) lancing

(D) Brazing

67. In MIG welding process, the gas used for welding steel :

(A) Pure argon gas

(B)  $\text{CO}_2$

(C) Argon Oxygen mixture

(D) Nitrogen