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1. Joule - Thomson coefficient for an ideal gas having equation  $Pv = RT$  is :  
(A) Unity                      (B) Infinite                      (C) 0.5                      (D) Zero
2. Cycle consisting of two isothermal and two isobaric processes is :  
(A) Ericsson                      (B) Joule                      (C) Stirling                      (D) Otto
3. Axial thrust will be negligible in case of :  
(A) helical gears                      (B) spiral gears  
(C) herringbone gears                      (D) bevel gears
4. Coarse grained steels :  
(A) are very tough                      (B) are less tough  
(C) do not have a tendency to distort                      (D) are lighter
5. A critical path has :  
(A) zero slack                      (B) minimum slack  
(C) maximum slack                      (D) infinite slack
6. Energy loss due to friction in laminar flow can be calculated either using Darcy's equation or Hagen - Poiseuille equation where friction factor is :  
(A)  $\frac{32}{Re}$                       (B)  $\frac{64}{Re}$                       (C)  $\frac{16}{Re}$                       (D) none of these
7. The shaft vibrations at nodes are :  
(A) maximum                      (B) zero                      (C) minimum                      (D) unpredictable
8. In metals subjected to cold working, strain hardening effect is due to :  
(A) twinning mechanism                      (B) fracture mechanism  
(C) dislocation mechanism                      (D) none of the above

9. Scheduling is :
- (A) allotting a job to a operator
  - (B) allotting a job to a machine
  - (C) fixing the time of completion of a job
  - (D) detailing the sequence of operation job-wise and machine wise
10. The impeller used in mud pumps is :
- (A) open type
  - (B) semi open type
  - (C) shrouded on one side only
  - (D) shrouded on both sides
11. A mechanism forms a structure when the degrees of freedom is equal to :
- (A) 2
  - (B) 1
  - (C) 0
  - (D) -1
12. Which of the following defect can occur due to improper design of a gating system ?
- (A) shrinkage
  - (B) porosity
  - (C) mould erosion
  - (D) any of the above
13. PERT is mainly useful for :
- (A) large projects
  - (B) large and complex projects
  - (C) research and development projects
  - (D) any small or large projects
14. Zeroth law of thermodynamics defines :
- (A) internal energy
  - (B) enthalpy
  - (C) temperature
  - (D) pressure
15. In a vibrating system the damping factor is unity, then :
- (A) the system will have no vibration
  - (B) the system will be highly damped
  - (C) the system will be critically damped
  - (D) the system will be under-damped
16. In EDM, the number of discharges per minute may be as high as :
- (A) 3000
  - (B) 6000
  - (C) 60,000
  - (D) 600,000
17. Work sampling is used to find :
- (A) percentage occurrence of certain activity
  - (B) rating of a job
  - (C) pre - determined motion time data
  - (D) standard time for a repetitive operation

18. If the diameter of a centrifugal pump impeller is doubled keeping the discharge and speed constant, then the head needs to be reduced by :
- (A) 16 times            (B) 4 times            (C) 2 times            (D) 8 times
19. A parabolic cam is so named because its :
- (A) Profile is parabolic  
(B) Follower displacement vs time plot is parabolic  
(C) follower velocity vs time plot is parabolic  
(D) follower acceleration vs time plot is parabolic
20. The tool may fail suddenly because of :
- (A) Crater wear            (B) Flank wear  
(C) Both crater and flank wear            (D) Spalling
21. Break - even analysis is a :
- (A) short term analysis  
(B) long term analysis  
(C) average of short and long term analysis  
(D) none of the above
22. A double - slider four - bar mechanism consisting of two turning pairs and two sliding pairs, will have a degree of freedom equal to :
- (A) 1            (B) 2            (C) 3            (D) 4
23. A ship is seen to enter sea from a river. Its depth of submergence will :
- (A) increase  
(B) decrease  
(C) remains same  
(D) depend on the material of the ship
24. Position feedback device on NC machine is :
- (A) Shaft encoder            (B) Linear scales  
(C) Inductosyns            (D) Any of the above
25. If the unit ordering cost is doubled, then the EOQ will :
- (A) be halved            (B) be doubled  
(C) increase by 1.414 times            (D) decrease by 1.414 times

26. The rivet head used for structural work such as roof trusses is usually :
- (A) pan head (B) snap head  
(C) conical head (D) counter sunk head
27. Bernoulli's equation is applicable between any two points in :
- (A) rotational flow of an incompressible fluid  
(B) irrotational flow of compressible or incompressible fluid  
(C) steady, rotational flow of an incompressible fluid  
(D) steady, irrotational flow of an incompressible fluid
28. The standard input file format for 3-D printing using Fused Deposition Method is :
- (A) .stl (B) .igs (C) .pdf (D) .stp
29. Which of the following material is difficult to be spot welded ?
- (A) Stainless steel (B) Copper  
(C) Cold rolled mild steel (D) Hot rolled mild steel
30. Which of the following is a technique for forecasting ?
- (A) Exponential smoothing (B) Gantt chart technique  
(C) PERT/CPM (D) Control charts
31. A control volume refers to :
- (A) a specified mass (B) a fixed region in space  
(C) an isolated system (D) a reversible process
32. Which process does not increase the fatigue strength ?
- (A) cold working (B) shot peening  
(C) grinding and lapping (D) hot working
33. Which of the following type of layout is suitable for automobile manufacture ?
- (A) Process layout (B) Product layout  
(C) Fixed position layout (D) Combination layout
34. A water supply pipeline changes its alignment through a bend when the flow in the pipeline is increased by operating a valve. The flow in the bend is classified as :
- (A) steady, uniform flow (B) unsteady, uniform flow  
(C) unsteady, non-uniform flow (D) steady, non-uniform flow

35. The factor to be considered in design of hydrodynamic journal bearing is :  
(A) specific pressure (B) rubbing speed  
(C) viscosity of lubricant (D) all of the above
36. How many slip systems are present in an HCP crystal structure ?  
(A) 3 (B) 6 (C) 12 (D) None of these
37. Which stainless steel is used in cryogenic vessels ?  
(A) Ferritic (B) Austenitic  
(C) Martensitic (D) None of the above
38. If the first and last gears are at the same axis, then the type of gear train is known as :  
(A) Compound gear train (B) Epicyclic gear train  
(C) Reverted gear train (D) Uniaxial gear train
39. The main advantage of the line organization is :  
(A) quick decisions at all the levels  
(B) defined responsibilities at all the levels  
(C) effective control  
(D) all of the above
40. A Public Limited Company can be started by :  
(A) not less than 7 persons (B) not less than 3 persons  
(C) not less than 2 persons (D) none of the above
41. Which component is also called wrist pin ?  
(A) King pin (B) Piston pin (C) Shackle pin (D) Cotter pin
42. The term 'valve lash' in case of over head valve engine refers to :  
(A) Valve noise when it hits the seat  
(B) Clearance between valve tip and valve actuating component  
(C) Clearance between valve face and seat  
(D) Valve noise when it hits the rocker tip
43. When the stroke is more than the bore in a piston engine, it is called :  
(A) Over - square engine (B) Boxer engine  
(C) Under - square engine (D) None of the above

44. The material on the positive plate of a fully charged lead acid battery is :  
(A) Lead peroxide seen as chocolate brown colour  
(B) Spongy lead seen as grey colour  
(C) Lead peroxide seen as grey in colour  
(D) Spongy lead seen as chocolate brown in colour
45. The necessity of a radiator cap is to :  
(A) Increase the boiling point of the coolant  
(B) Relieving the system pressure when required  
(C) Relieving the system vacuum when required  
(D) All of the above
46. The working principle of a conventional automobile clutch is :  
(A) Pascal's law (B) Bernoulli's principle  
(C) Friction (D) Hydraulic pressure
47. The component which gives out the heat into atmosphere in a conventional car A/C system is :  
(A) Evaporator (B) Compressor  
(C) Condenser (D) None of the above
48. In Hotchkiss drive for a conventional heavy vehicle, the driving thrust is taken by :  
(A) Propeller shaft (B) Shock absorber (C) Leaf spring (D) All of the above
49. In a torque converter system, the engine flywheel is directly connected to :  
(A) Impeller (B) Stator (C) Turbine (D) Vane pump
50. In the case of poppet valves, valve guide makes contact with :  
(A) Valve head (B) Valve face (C) Valve stem (D) Valve margin
51. The movement of a vehicle with respect to its transverse axis is called :  
(A) Rolling (B) Pitching  
(C) Yawing (D) None of the above
52. In full floating type axle arrangement, the axle casing has to take up :  
(A) Driving torque (B) Vehicle load  
(C) All of the above (D) None of the above

53. Without considering the number of cylinders, which engine will have the least crank shaft length :
- (A) Inline engine (B) V engine  
(C) W engine (D) Radial engine
54. In a Wankel engine, the four processes viz. suction, compression, power and exhaust happens within :
- (A) 1/3 rotation (B) 1/2 rotation (C) 2 rotations (D) 1 rotation
55. EGR system helps mainly in reducing which pollutant ?
- (A) CO<sub>2</sub> (B) CO (C) HC (D) NO<sub>x</sub>
56. In a 4 stroke engine, if the crank shaft gear has 30 teeth, then the camshaft gear will have :
- (A) 15 teeth (B) 60 teeth  
(C) 120 teeth (D) None of the above
57. In a conventional distributor less ignition system equipped on a six cylinder engine, the minimum number of ignition coils will be :
- (A) 6 (B) 2 (C) 3 (D) None of the above
58. In a conventional ignition system, the condenser is located :
- (A) Inside the distributor cap (B) On the distributor shaft  
(C) On the ignition coil (D) None of the above
59. Double declutching is required during :
- (A) Up - shifting (B) Down - shifting  
(C) Shifting to neutral (D) Shifting to reverse
60. In a normal head lamp, theoretically the reflector should have the shape :
- (A) Elliptical curve (B) Parabolic curve  
(C) Hyperbolic curve (D) Hemispherical curve
61. Automotive alternator housing is made up of :
- (A) Cast iron (B) Pressed steel  
(C) Aluminium (D) None of the above

62. When the clutch free pedal play is excessively increased, then :
- (A) Gear engagement becomes smooth
  - (B) Gear engagement becomes hard
  - (C) Clutch life increases
  - (D) Both (A) and (C)
63. The effect of centrifugal force is more prominent in the working of :
- (A) Coil spring clutch
  - (B) Diaphragm spring clutch
  - (C) Both coil spring and diaphragm spring clutch equally
  - (D) Neither coil spring nor diaphragm spring clutch
64. During stall period in a torque converter,
- (A) Maximum torque multiplication occurs
  - (B) Turbine is stationary and impeller is rotating at engine speed
  - (C) Maximum slip occurs
  - (D) All of the above
65. In which type of differential gears, the pinion shaft axis lies below the crown wheel axis ?
- (A) Straight bevel gear arrangement
  - (B) Spiral bevel gear arrangement
  - (C) Hypoid gear arrangement
  - (D) All of the above
66. In a normal differential, the ends of the cross or spider will be held in the :
- (A) Sun gear
  - (B) Pinion gear
  - (C) Crown gear
  - (D) Star gear
67. The component which connects the leaf spring set to the axle casing is :
- (A) Centre bolt
  - (B) Shackle
  - (C) U bolt
  - (D) Leaf clamp
68. The helper spring comes into action when :
- (A) The load on the main leaf set is more
  - (B) The deflection of the main leaf set is more
  - (C) Both (A) and (B)
  - (D) None of the above