

**DMRC ME PAPER-II**

1. Time period of the earth's satellite does not depend on
- Acceleration due to gravity
  - Universal gravitational constant
  - Mass of the satellite
  - Height of satellite above the surface of earth

Ans: d

2. Property of a material which enables it to recover after unloading is complete but instantaneous, is known as
- Inelasticity
  - Anelasticity
  - Creep
  - Plasticity

Ans: b

3. Smallest hole that can be punched in a plate of thickness  $t$ , if maximum crushing stress in punch is 4 time the shear stress of plate, is
- $t$
  - $\frac{t}{2}$
  - $2t$
  - $\frac{t}{4}$

Ans: a

4. In a reversible adiabatic process the ratio of  $T/T$  is equal to
- $\left(\frac{p_1}{p_2}\right)^{\frac{y-1}{y}}$
  - $\left(\frac{p_2}{p_1}\right)^{\frac{y-1}{y}}$
  - $\left(\frac{V_1}{V_2}\right)^{\frac{y-1}{y}}$

d)  $\left(\frac{V_2}{V_1}\right)^{\frac{y-1}{y}}$

Ans: a

5. In isothermal expansion work done by gas depends upon
- Atomicity of gas only
  - Expansion ratio only
  - Adiabatic index
  - Both (a) and (b) above

Ans: d

6. Universal gas constant is defined as equal to product of the molecular weight of the gas and
- Specific heat at constant pressure
  - Specific heat at constant volume
  - Ratio of two specific heats
  - Gas constant

Ans: d

7. If a gas vapour is allowed to expand through a very minute aperture, then such a process is known as
- Free expansion
  - Throttling process
  - Adiabatic expansion
  - Parabolic expansion

Ans: b

8. In an isothermal process, the internal energy
- Increases
  - Decreases
  - Remains constant
  - First increases and then decreases

Ans: c

9. The value of  $\int \frac{dQ}{T}$  for reversible process is equal to
- + ve value
  - ve value

- c) Zero  
d) any one of the above

Ans: c

10. The entropy of steady an isolated system increases during a expressing  
a) Reversible process  
b) Irreversible process  
c) Ideal process  
d) Polytrophic process

Ans: b

11. In case of steady flow system work can be evaluated using an expression  
a)  $w = \int \rho du$   
b)  $w = -\int u d\rho$   
c)  $w = Q - \Delta E$   
d)  $w = \int u d\rho$

Ans: b

12. The cyclic integral of  $(\delta Q - \delta w)$  for a process is equal to  
a) Positive  
b) Negative  
c) Zero  
d) Unpredictable

Ans: c

13. The area under curve on T-s diagram represents  
a) Heat transfer for all processes  
b) Heat transfer for all adiabatic processes  
c) Heat transfer for real processes  
d) None of the above

Ans: c

14. The unit of entropy is  
a) J/kgK  
b) J/K  
c) J/s  
d) J/kgKs

Ans: b

15. Total time of flight (t) of a projectile on a horizontal plane is equal to

$$\frac{2u \sin a}{g}$$

a)  $t = \frac{2u \cos a}{g}$

$$\frac{2u \cos a}{g}$$

b)  $t = \frac{2u \tan a}{g}$

$$\frac{2u \tan a}{g}$$

c)  $t = \frac{2u \cot a}{g}$

$$\frac{2u \cot a}{g}$$

d)  $t = \frac{2u \cot a}{g}$

Ans: a

16. Ignition quality of petrol is expressed by  
a) Octane number  
b) Calorific value  
c) Centane number  
d) Self ignition temperature

Ans: c

17. In petrol engine using a fixed octane rating fuel, increase of engine speed will  
a) Increase the knocking tendency  
b) Decrease the knocking tendency  
c) Not affect the knocking tendency  
d) Unpredictable

Ans: a

18. For low speed operation in the idling in petrol engines, the engine requirements are for  
a) Lean mixture  
b) Theoretically correct mixture  
c) Rich mixture  
d) Lean mixture

Ans: c

19. Method of governing used in petrol engine is  
a) Quantity governing  
b) Quantity governing  
c) Combined governing

d) Partial governing

Ans: a

20. In a steam engine the steam entrapped in  
Entrapped in the cylinder after the close of  
exhaust valve is known as

- a) Clearance volume steam
- b) Cushion steam
- c) Missing steam
- d) None of these

Ans: b

21. Locomotive type boiler is

- a) Horizontal multi tabular water
- b) Water wall enclosed durance type
- c) Vertical tabulate type
- d) None of these

Ans: a

22. The number of drums is Benson steam  
generator is

- a) One
- b) Two
- c) one steam drum and one water drum
- d) No drum

Ans: d

23. Bomb calorimeter is used to determine

- a) Higher calorific value at constant volume
- b) Lower calorific value at constant volume
- c) Higher calorific value at constant volume
- d) Lower calorific value at constant volume

Ans: a

24. O<sub>2</sub> content in atmospheric air on weight basis  
is

- a) 21%
- b) 23%
- c) 30%
- d) 40%

Ans: b

25. Water level indicators generally used in a  
boiler are

- a) One
- b) Two
- c) Three
- d) Four

Ans: b

26. In order to obtain super heated steam a super  
heater is added in an existing boiler as a  
result, furnace vacuum will

- a) Remain unaffected
- b) Improve
- c) Worsen
- d) May improve/worsen depending on size

Ans: c

27. Maximum energy loss in a boiler occurs due  
to

- a) Unburnt carbon in ash
- b) Incomplete combustion
- c) Ash content
- d) Fuel gases

Ans: d

28. Film boiling occurs at

- a) Very low pressure
- b) Atmospheric pressure
- c) Medium pressure
- d) Fuel gases

Ans: d

29. The feed check valve is used in order to

- a) Regulate flow of boiler water
- b) Check level of water in boiler drum
- c) Recalculate unwanted feed water
- d) Allow high pressure feed water to flow to  
drum and not allow reverse flow to take  
place

Ans: d

30. As the compression ration increases, the  
volumetric efficiency of air compressor

- a) Increases

- b) Decreases
- c) Remises constant
- d) none of these

Ans: b

31. Combining impulse stages in series results in

- a) Increase of speed
- b) Decrease of speed
- c) Speed remains unaffected
- d) None of these

Ans: b

32. Velocity of steam at any section in the nozzle (neglecting friction is)

- a)  $91.5\sqrt{U}$
- b)  $\sqrt{91.5U}$
- c)  $\sqrt{91.5U}$
- d)  $\frac{91.5}{\sqrt{U}}$

Ans: a

33. Critical pressure ration for a nozzle is represented by the relation

- a)  $\left(\frac{2}{n+1}\right)^{\frac{n}{n-1}}$
- b)  $\left(\frac{n}{n+1}\right)^{\frac{2}{n+1}}$
- c)  $\left(\frac{1}{n+1}\right)^{\frac{2}{n+1}}$
- d)  $\left(\frac{2}{n+1}\right)^{\frac{n-1}{n}}$

Ans: a

34. The most efficient method of compressing air is to compress it

- a) Isothermally
- b) adiabatically
- c) Isentropically
- d) Isochronically

Ans: a

35. For minimum work in multistage compression the work done

- a) During first stage should be least
- b) During last stage should be least
- c) during all stages should be equal
- d) should be in direct proportion be to the pressure ratio

Ans: c

36. optimum intermediate pressure in the stage compressor is

- a) Average of suction and delivery
- b) 50% of difference of two
- c) Geometric mean of two
- d) None of these

Ans: c

37. Rotary compressor is best suited for

- a) Large quantity of air at high pressure
- b) Small quantity of air at high pressure
- c) Small quantity of air at low pressure
- d) Large quantity of air at low pressure

Ans: d

38. A jet engine work on the principle of conservation of

- a) Mass
- b) Energy
- c) Flow
- d) linear momentum

Ans: d

39. Combining impulse stages in series results in

- a) Toughness
- b) Fatigue
- c) Creep
- d) corrosion resistance

Ans: c

40. Brazing metals and alloy commonly used are

- a) Copper
- b) Copper
- c) Silver alloys
- d) All of these

Ans: d

41. The efficiency of jet engine is

- a) Higher at ground
- b) Higher at high altitudes
- c) Same all altitudes
- d) Higher at high speed

Ans: b

42. The efficiency of jet engine is

- a)  $\rho = 0, \tau = 0$  and  $a = 1$
- b)  $\rho = 1, \tau = 0$  and  $a = 0$
- c)  $\rho = 0, \tau = 1$  and  $a = 0$
- d)  $\tau = 0, a = \rho = 1$

Ans: d

43. The critical radius of insulation for a spherical shell is

- a)  $\frac{k}{h}$
- b)  $\frac{2k}{h}$
- c)  $\frac{k}{2h}$
- d)  $\frac{2k}{3h}$

Ans: b

44. Planks law holds good for

- a) Black bodied
- b) polished bodied
- c) All coloured bodied
- d) all of these

Ans: a

45. A moderator

- a) Absorbs neutrons
- b) Does not absorb neutrons
- c) Accelerates neutrons
- d) None of these

Ans: b

46. By normalizing of steel, its

- a) Ultimate tensile strength increases
- b) Yield point increases
- c) Ductility decreases
- d) All of these

Ans: d

47. Process of production of articles having a soft ductile interior and a very hard surface, is known as

- a) Hardening
- b) Tempering
- c) Case-hardening
- d) Annealing

Ans: c

48. Advantage of austempering is

- a) More uniform microstructure is obtained
- b) Warping and distortions are avoided
- c) Quenching cracks are avoided
- d) All of these

Ans: d

49. Brinell hardness number is equal to

- a)  $\frac{P}{D - \sqrt{(D^2 - d^2)}}$
- b)  $\frac{P}{D(D - \sqrt{D^2 - d^2})}$
- c)  $\frac{2P}{D - \sqrt{D^2 - d^2}}$
- d)  $\frac{2P}{D(D - \sqrt{(D^2 - d^2)})}$

Ans: d

50. Frequency of oscillation of an instrument indicating device is a function of

- a) Mass
- b) Damping
- c) Sensitivity
- d) Both damping and sensitivity

Ans: d