50 Multiple Choice Questions on Mechanical Engineering

by Bhargob Borthakur - Thursday, January 19, 2017

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Q1. Which one of the following is correct?

(IES, 2008)

In normal shock wave in one dimensional flow

- A) the entropy remains constant
- B) the entropy increases across the shock
- C) the entropy decreases across the shock
- D) the velocity, pressure, and density increase across the shock

Q2. Which of the following are the limitation of the powder metallurgy?

(IES, 2006)

- A) High tooling and equipment costs
- B) Wastage of material
- C) It cannot be automated
- D) Expensive metallic powders

Select the correct answer using the code

Code-1) Only A and B

Code-2) Only B and D

Code-3) Only A and D

Code-4) Only A, B and D

Q3. An Orthotropic material under plane stress condition will have

(IES, 2006)

- A) 15 independent elastic constants

- B) 5 independent elastic constants
- C) 6 independent elastic constants

Q4. Subooling in the condenser of a refrigeration system is advisable when

(IES, 2001)

- A) expansion valve is at a higher elevation than condenser
- B) there is a large pressure drop in the line connecting condenser to the expansion valve
- C) the refrigeration effect is to be increased
- D) the compressor work is to reduced

Correct code

Code1) A and B

Code2) A, C & D

Code 3) B, C and D

Code 4) A, B & C

Q5. When dry bulb and thermodynamic wet bulb temperatures are same

(IES, 2001)

- A) Humidity ratio is 100%
- B) Partial pressure of water vapour equal total pressure
- C) Air is fully saturated
- D) Dew point temperature is reached
- E) All of these
- F) None of these

Q6. In a cooling tower, the minimum temperature to which water can be cooled is equal to the

- A) dew point temperature of the air at the inlet
- B) dry bulb temperature of the air at the inlet
- C) thermodynamic wetbulb temperature of the air at the inlet

- D) mean of the dew point and dry bulb temperature of the air at inlet

Q7. The cutting tool material required to sustain high temperature is

(IES, 2010)

- A) high carbon steel alloys
- B) composite of lead and steel
- C) Cermet
- D) alloy of steel; Zinc and tungsten

Q8. Correct statement is:

(IES, 2010)

- A) Characteristic of any series of alloy cannot be found by phase.
- B) Phase diagram doesn’t give amount of phases which are a function of composition, temperature, pressure.
- C) The phase may be liquid or vapoure with ordered crystal structure.
- D) Phase diagram provides the information on how rapidly equilibrium is reached.

Q9. Pertaining to a steam boiler, which of the following is correct?

(IES, 2011)

- A) Primary boiler heat transfer surface includes evaporator section, economizer and air preheater.
- B) Primary boiler heat transfer surface includes evaporator section, economizer and superheater section.
- C) Primary boiler heat transfer surface includes evaporator, superheater and reheat section.
- D) None of these.

Q10. In axial flow compressor, stalling is the phenomenon of

(IES, 2011)

- A) air motion at sonic velocity
- B) air steam blocking the passage
- C) reversed air flow

- D) air steam not following the blade contour.

Q11. Which of the following statement relates to expression "pvc"?

(IES, 2009)

- A) Pressure rise in a duct due to normal closure of valve in the duct.
- B) Pressure rise in a duct due to abrupt closure of valve in the duct
- C) Pressure rise in a duct due to slow opening of valve in the duct.
- D) Pressure rise in a duct due to propagation of supersonic wave through the duct.

Q12. The tranverse shear stress acting in a beam of rectangular cross section, subjected to a transverse shear load is

(GATE, 2008)

- A) variable with maximum at the bottom of the beam
- B) variable with maximum at the top of the beam
- C) uniform
- D) variable with maximum of the neutral axis

Q13. An axial residual compressive stress due to a manufacturing process is present on the outer surface of a rotating shaft subjected to bending. Under a given bending load the fatigue life of the shaft in the presence of the residual compressive stress is

(GATE, 2008)

- A) Decrease
- B) Increase
- C) Neither increase nor decrease
- D) Increase or decrease depending on external bending load

Q14. Tooth interferace in an external involute spur gear pair can be reduced by

(GATE, 2010)

- A) decreasing module
- B) decreasing center distance between gear pair

- C) decreasing pressure angle
- D) increasing number of gear teeth

Q15. In CNC program block N002 G02 G91 X40 Z40.. G02 and G91 Refer to

(GATE)

- A) circular interpolation in clockwise[CW] direction and incremental dimension
- B) circular interpolation in counter clockwise direction and absolute dimension
- C) circular interpolation in CCW direction and absolute dimension
- D) circular interpolation in CW direction and absolute dimension

Q16. Vechicle manufacturing assembly line is an example of

(Gate, 2010)

- A) product layout
- B) manual layout
- C) fixed layout
- D) process layout

Q17. The two reference fuels used for cetane rating are

- A) cetane and isocetane
- B) cetane and tetraethyl lead
- C) centane and n-heptane
- D) centane and alpha-methyl napthalene

Q18. Crankcase explosion in IC engine usually occurs as

- A) first a mild explosion followed by a big explosion
- B) first a big explosion followed by a mild explosion
- C) both mild and big explosions occur simultaneously
- D) unpredictable
- E) never occurs

Q19. A 5 BHP Engine runing at full load would consume diesel of the order of

- A) 0.3kg/hr
- B) 1 kg/hr
- C) 3kg/hr
- D) 10kg/hr

Q20. If the area of cross section of a wire is circular and if the radius of the circle decreases to half its original value due to the stretch of the wire by load, then the modulas of elasticity of the wire be

- A) 1/4 th of its original value
- B) halved
- C) unaffected
- D) doubled

Q21. A reversible isothermal process will involves no change of entropy if it takes place at

- A) zero temperature
- B) infinity temp.
- C) minus zero temp
- D) any of the above

Q22. Consider the following statements about critical point of water:

- A) the latent heat is zero
- B) the liquid is denser than its vapour
- C) steam generators can operate above this point .
- D) all of the above

Q23. Which of the following analysis is used to determine the behaviour of coal and its suitability for a particular boiler

- A) critical analysis
- B) flue gas analysis
- C) proximate analysis
- D) ultimate analysis

Q24. The normal stress in a fluid will be constant in all directions at a point only if

- A) it is frictionless
- B) it is at rest
- C) it has uniform viscosity
- D) it has zero viscosity

Q25. If the section modulus of a beam decreases then bending stress will

- A) decrease
- B) increase
- C) there is no such correlation
- D) unpredictable

Q26. As the slenderness ratio of a column increase its compressive strength

- A) decrease
- B) increase
- C) remain unchanged
- D) may increase or decrease depending on length

Q27. Oldham's coupling is the

- A) second inversion of double slider crank chain
- B) third inversion of double slider crank chain
- C) fourth inversion of double slider crank chain.
- D) none

Q28. The Ackermann steering mechanism is preferred to the Davis type in automobiles

- A) the former is mathematically accurate
- B) the former is having turning pair
- C) the former is most economical
- D) the former is most rigid

Q29. For isochronous, spring controlled governor, the controlling force with increase in radius of rotation

- A) remain constant
- B) increase
- C) decrease
- D) may increase or decrease depending on size

Q30. Mittre gear used for

- A) great speed reduction
- B) equal speed
- C) minimum backlash
- D) minimum axial thrust

Q31. In thermit welding thermit used is mixture of

- A) aluminium and iron oxide
- B) aluminium and charcoal
- C) iron oxide and charcoal
- D) none of these

Q32. Tomlinson recorder is associated with the measurement of

- A) surface flaws
- B) surface perpendicularity
- C) surface finish
- D) surface curvature

Q33. A sine bar is specified by

- A) its total length
- B) centre distance between the two rollers
- C) size of the roller
- D) weight of sine bar

Q34. Which of the following forecasting techniques is not suited for making forecasts for planning production schedules in short range?

- A) moving average
- B) exponential moving average
- C) regression analysis
- D) delphi

Q35. Production flow analysis (PFA) Is a method of identification part families that uses data from

- A) engineering drawing
- B) bill of material
- C) production schedule
- D) both A and B option
- E) both B and C option
- F) only A
- G) none of these

Q36. One of the following statements about PRS (periodic recordering system) is not true. Identify:

- A) PRS requires continuous monitoring of inventory levels
- B) PRS is useful in control of perishable items
- C) PRS provies basis for adjustments to account for variations in demand
- D) Both A and B
- E) None of these

Q37. Separation of flow occurs when pressure gradient

- A) becomes negative
- B) changes abruptly
- C) tends to approach zero
- D) reduces to a value when vapour formation starts

Q38. Whiriling speed of a shaft coincide with the natural frequency of the

- A) longitudinal vibration
- B) transverse vibration
- C) torsional vibration
- D) coupled between torsional vibration

Q39. Which of the following is known as maximum capacity bearing?

- A) filling notch bearin
- B) single row bearing
- C) angular contact bearing
- D) double row bearing

Q40. In adiabatic flow with friction, the stagnation temperature along the streamline

- A) remain constant
- B) Increases
- C) Decreases
- D) unpredictable
- E) first increase than decrease

Q41. Clapeyron equation is applicable for the region at

- A) saturation point of vapour
- B) saturation point of liquid
- C) triple point
- D) critical point

Q42. Oil separator in a refrigeration cycle is installed between the

- A) compressor and condenser
- B) condenser and metering device
- C) metering device and evaporator
- D) evaporator and compresser

Q43. The loss of strength in compression due overloading is known as

- A) Bouschinger effect
- B) relexation
- C) creep
- D) resilience
- E) hysteresis

Q44. In sheet metal work, the cutting force on the tool can be reduce by

- A) grinding the cutting edges sharp
- B) increasing the hardness of tool
- C) providing shear angle on tool
- D) increasing the hardness of die.

Q45. Large cylindrical tanks sealed in warm weather are found to buckle and collapse when temperature drops a few degrees. This can be avoided by

- A) providing ribs inside
- B) keeping inside pressurised
- D) keeping inside under vaccumb
- E) providing a vent on the tank

Q46. Which of the following sets of standard flows is superimposed to represent the flow around a rotating cylinder?

(IES, 2000)

- A) Sink, vortex and uniform flow
- B) source, vortex & uniform flow
- C) doublet, vortex and uniform flow
- D) vortex and uniform

Q48. In a petrol engine car, which one of the following performance characteristics is affected by the front-end volatility of gasoline used?

- A) engine warmup and spark plug fouling
- B) vapour lock, engine warm up and spark plug fouling
- C) spark plug fouling and hot starting
- D) hot starting and vapour lock

Q49. Lowering the evaporator pressure in a vapour compression cycle

(SSC, 2015)

- A) decreases the required work and COP

- B) increases the required work and COP
- C) Increases the required work and decreases the COP
- D) decrease the required work and increases the COP

Q50. The process used for reliving the internal stress previously set up in the metal and for increasing the machinability of steel, is

(SSC, 2015)

- A) Normalising
- B) full annealing
- C) Process annealing
- D) spheroidising

Answers:

Q1. B

Q2. code 3

Q3. B

Q4. code 3)

Q5. E

Q6. A

Q7. C

Q8. A

Q9. C

Q10. A

Q11. D

Q12. D

Q13. B

Hint: Diagram of Gerber's parabola.

Q14. A

Q15. A

Hint:

N002 - circular interpolation in CW direction

G91- Incremental dimension

Q16. B

Q17. D

Q18. A

Q19. B

Q20. C

Hint: Since modulas of elasticity is the property of material, it will be same under all conditions.

Q21. D

Hint: According to thermodynamics third law, a reversible isothermal process which takes place at temperature zero, infinity or minus zero involves no change of entropy.

Q22. A and C

Hint: At critical point, the latent heat is zero and steam generators can operate above this point as in case of once through boilers.

Q23. C

Hint: Proximate analysis determine the four parts moisture, volatility, ash and fixed carbon.

Q24. B

Q25. B

Q26. A

Q27. B

Q28. B

Q29. A

Q30. B

Q31. A

Q32. B

Q33. B

Q34. D

Q35. E

Q36. A

Q37. B

Q38. B

Q39. A

Q40. A

Q41. A

Q42. A

Q43. A

Q44. C

Q45. E

Q46. C

Q48. B

Q49. C

Q50. D
