



SJVN LIMITED

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Participant ID	
Participant Name	
Test Center Name	
Test Date	18/03/2023
Test Time	12:30 PM - 2:30 PM
Subject	Field Engineer(Mechanical)

Section : Subject Related

Q.1 A motor weighs 10 kN and it is lifted with an eye bolt. The eye bolt is screwed in the frame of the motor. The eye bolt is made of carbon steel having yield point as  $400\text{ N/mm}^2$ . The factor of safety is 6. Determine the core diameter of the thread of the bolt.

- Ans ☒ 1. 14 mm
- ☒ 2. 10 mm
- ☒ 3. 20 mm
- ☒ 4. 22 mm

Question ID : 630680178778  
Status : Answered  
Chosen Option : 2

Q.2 Which of the following are the assumptions of simple EOQ model?

- A. Demand is known with certainty
- B. Demand and lead time are known
- C. Stockouts are allowed

- Ans ☒ 1. A and B
- ☒ 2. A, B, and C
- ☒ 3. B and C
- ☒ 4. A and C

Question ID : 630680178820  
Status : Answered  
Chosen Option : 2

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Q.3 Which of the following is an INCORRECT statement regarding modes of heat transfer?

Ans ☒ 1.

Fluid mechanics plays important role in the convection problems.

☒ 2.

An object may transfer heat by only one of the three heat transfer modes (conduction, convection, and radiation) at a time.

☒ 3. In conduction, Fourier's law is applicable.

☒ 4.

Radiation heat transfer involves a propagation of electromagnetic energy.

Question ID : 630680178742

Status : Answered

Chosen Option : 2

Q.4 A firm uses simple exponential smoothing with  $\alpha = 0.1$  for demand forecasting. The forecast for February was 500 units, whereas actual demand turned out to be 450 units. Forecast the demand for March.

Ans ☒ 1. 495 units

☒ 2. 505 units

☒ 3. 450 units

☒ 4. 550 units

Question ID : 630680178817

Status : Answered

Chosen Option : 3

Q.5 Considering uniform cooling in all directions. Find dimensions of a 90 mm cube after cooling down. Solidification shrinkage for the cast metal is 5%.

Ans ☒ 1. 88.5 mm

☒ 2. 80 mm

☒ 3. 90 mm

☒ 4. 85.5 mm

Question ID : 630680178811

Status : Answered

Chosen Option : 4

Q.6 Which of the following expressions is true for nozzle efficiency ( $\eta$ ) for the condition of large pressure ratio if A = actual change in the kinetic energy and B = ideal change in the kinetic energy?

Ans ☒ 1.  $\eta = A/B$

☒ 2.  $\eta = A + B$

☒ 3.  $\eta = A - B$

☒ 4.  $\eta = A \times B$

Question ID : 630680178764

Status : Answered

Chosen Option : 1

**Q.7** Which of the following are correct for water reservoir of hydroelectric plants?

- A. The purpose of the storing of water in the reservoir is to get a uniform power output throughout the year.
- B. A natural reservoir is a lake in high mountains.
- C. An artificial reservoir is made by constructing a dam across the river.

**Ans** ✓ 1. A, B, and C

✗ 2. B and C

✗ 3. A and C

✗ 4. A and B

Question ID : 630680178829

Status : Answered

Chosen Option : 3

**Q.8** The expected life for 90% of the bearing is 8000 hours. Calculate the rated bearing life in millions of revolutions ( $L_{10}$ ).  
The shaft rotates at 1450 revolutions per minute.

**Ans** ✓ 1. 700 million revolutions

✗ 2. 800 million revolutions

✗ 3. 1000 million revolutions

✗ 4. 1200 million revolutions

Question ID : 630680178775

Status : Answered

Chosen Option : 4

**Q.9** Which of the following is/are INCORRECT for pumped storage power plants?

- A. Pumped storage power plants supply the peak load for the base load power plants.
- B. Pumped storage power plants can be used with hydro, steam and engine plants.
- C. Pumped storage power plants can have only vertical shaft arrangement.

**Ans** ✗ 1. A, B, and C

✗ 2. B and C

✓ 3. C only

✗ 4. A and B

Question ID : 630680178830

Status : Answered

Chosen Option : 3

Q.10 Which of the following are correct for atomic packing factor (APF)?

- A. The APF is the fraction of solid sphere volume in a unit cell.
- B. For the FCC structure, the atomic packing factor is 0.74.
- C. For the BCC structure, the atomic packing factor is 0.74.

Ans ☒ 1. A and B  
☒ 2. B and C  
☒ 3. A and C  
☒ 4. A, B and C

Question ID : 630680178796  
Status : Answered  
Chosen Option : 2

Q.11 A two stage air compressor takes in air at 1 bar and the air is delivered from the HP cylinder to an air receiver at 9 bar. Calculate intermediate pressure.

Ans ☒ 1. 3 bar  
☒ 2. 8 bar  
☒ 3. 10 bar  
☒ 4. P bar

Question ID : 630680178757  
Status : Answered  
Chosen Option : 1

Q.12 A refrigerating system has a capacity of 12 tonnes. The work input is 32558 kJ/h. Find the heat rejected per hour.

Ans ☒ 1. 184478 kJ/h  
☒ 2. 800668 kJ/h  
☒ 3. 401058 kJ/h  
☒ 4. 100258 kJ/h

Question ID : 630680178727  
Status : Answered  
Chosen Option : 3

Q.13 Which of the following expressions is true for nozzle efficiency and nozzle velocity coefficient?

Ans ☒ 1. Nozzle efficiency = Nozzle velocity coefficient  
☒ 2. Nozzle efficiency = (Nozzle velocity coefficient)<sup>2</sup>  
☒ 3. Nozzle efficiency = 1/(Nozzle velocity coefficient)  
☒ 4. Nozzle efficiency = (Nozzle velocity coefficient)<sup>3</sup>

Question ID : 630680178765  
Status : Answered  
Chosen Option : 3

Q.14 Which of the following is NOT an advantage of regenerative cycle over simple Rankine cycle?

Ans ☒ 1.

The heating process in the boiler tends to become reversible.

☒ 2. Heat rate is reduced.

☒ 3. The thermal efficiency is improved.

☒ 4. A bigger size condenser is required.

Question ID : 630680178734

Status : Answered

Chosen Option : 2

Q.15 Which of the following activities are associated with network techniques?

A. Critical activities

B. Dummy activities

C. Non-critical activities

Ans ☒ 1. B and C

☒ 2. A and B

☒ 3. A, B and C

☒ 4. A and C

Question ID : 630680178824

Status : Answered

Chosen Option : 3

Q.16 Find loss of head when a pipe of diameter 200 mm is suddenly enlarged to a diameter of 400 mm. The rate of flow of water through the pipe is  $0.25 \text{ m}^3/\text{s}$ . (The options are rounded up to one decimal place.)

Ans ☒ 1. 3.6 m of water

☒ 2. 1.8 m of water

☒ 3. 0.9 m of water

☒ 4. 5.4 m of water

Question ID : 630680178753

Status : Answered

Chosen Option : 3

Q.17 Determine moment of inertial of a 4 m long column if Young's modulus for the column material is 84000 MPa, buckling load is 9 kN and both the ends are pinned.

Ans ☒ 1.  $1,73,869 \text{ mm}^4$

☒ 2.  $2,46,567 \text{ mm}^4$

☒ 3.  $85,236 \text{ mm}^4$

☒ 4.  $5,10,236 \text{ mm}^4$

Question ID : 630680178790

Status : Answered

Chosen Option : 3

**Q.18** Find end thrust on the shaft per unit mass flow of an impulse turbine if axial component of velocity at inlet and outlet are 172 m/s and 129 m/s, respectively.

- Ans**
- ✓ 1. 43 N
  - ✗ 2. 301 N
  - ✗ 3. 172 N
  - ✗ 4. 129 N

Question ID : 630680178755  
Status : Answered  
Chosen Option : 3

**Q.19** The diameters of a pipe at two sections of a pipe are 100 mm and 150 mm, respectively. Find velocity of fluid where the pipe diameter is 150 mm if the velocity of fluid is 5 m/s, where the pipe diameter is 100 mm.

- Ans**
- ✗ 1. 8.88 m/s
  - ✗ 2. 4.44 m/s
  - ✗ 3. 1.11 m/s
  - ✓ 4. 2.22 m/s

Question ID : 630680178746  
Status : Answered  
Chosen Option : 4

**Q.20** What is the elongation due to self-weight of a bar if the length of the bar is 'L', cross-section area is 'A', the weight of the bar is 'W' and Young's modulus is 'E'?

- Ans**
- ✓ 1.  $WL/2AE$
  - ✗ 2.  $WL/4AE$
  - ✗ 3.  $WL/3AE$
  - ✗ 4.  $WL/AE$

Question ID : 630680178791  
Status : Answered  
Chosen Option : 1

**Q.21** Izod and Charpy tests are associated with which of the following tests?

- Ans**
- ✓ 1. Impact test
  - ✗ 2. Tensile test
  - ✗ 3. Compression test
  - ✗ 4. Fatigue test

Question ID : 630680178788  
Status : Answered  
Chosen Option : 1

**Q.22** Calculate indicated power of a single cylinder reciprocating compressor if the work input to the compressor is 500 J and the compressor is driven at 1200 rpm.

- Ans** ☒ 1. 10 kW  
☐ 2. 5 kW  
☐ 3. 15 kW  
☐ 4. 20 kW

Question ID : 630680178756  
Status : Answered  
Chosen Option : 3

**Q.23** Which of the following is an INCORRECT statement?

- Ans** ☐ 1. Rotary compressors are used where large quantities of air is needed at relatively low pressure.  
☒ 2. In multi stage compression, there is increase in work required per stroke.  
☐ 3. In multi stage compression, torque delivered is more uniform.  
☐ 4. In axial flow compressor, the blades are arranged in the same way as in a reaction turbine.

Question ID : 630680178760  
Status : Answered  
Chosen Option : 3

**Q.24** Which of the following is a DISADVANTAGE of hydro-electric plant?

- Ans** ☒ 1. These plants are usually located in hilly areas.  
☐ 2. The efficiency of the plant does not change with age.  
☐ 3. The cost of generation of electricity varies little with the passage of time.  
☐ 4. The plant has no stand by losses.

Question ID : 630680178828  
Status : Answered  
Chosen Option : 1

**Q.25** Which of the following are the objectives of lubricants in the sliding contact bearings?

- A. To protect the journal and bearing from corrosion.  
B. To prevent wear.  
C. To carry away heat generated due to friction.

- Ans** ☐ 1. A and B  
☐ 2. A and C  
☐ 3. B and C  
☒ 4. A, B and C

Question ID : 630680178776  
Status : Answered  
Chosen Option : 3

**Q.26** Calculate cost per piece if  $EOQ = 13.41$ , procurement cost = ₹15 per order, Annual usage = 60 units and cost of carrying inventory = 10%

- Ans**
- ✓ 1. ₹100
  - ✗ 2. ₹200
  - ✗ 3. ₹150
  - ✗ 4. ₹300

Question ID : 630680178819

Status : Answered

Chosen Option : 2

**Q.27** One of the two parallel black plates ( $0.5 \text{ m} \times 1 \text{ m}$ ) is maintained at  $1000^\circ\text{C}$  and the other at  $500^\circ\text{C}$ . What is the net radiant heat exchange between the two plates if Stefan-Boltzmann constant is  $5.67 \times 10^{-8}$  and  $F_{12}$  is 0.285?

- Ans**
- ✗ 1. 9.16 kW
  - ✗ 2. 36.66 kW
  - ✓ 3. 18.33 kW
  - ✗ 4. 50 kW

Question ID : 630680178743

Status : Answered

Chosen Option : 2

**Q.28** Find depth of centre of pressure for a rectangular plane surface 2 m wide and 3 m deep.

- Ans**
- ✓ 1. 2 m
  - ✗ 2. 3 m
  - ✗ 3. 4 m
  - ✗ 4. 1 m

Question ID : 630680178745

Status : Answered

Chosen Option : 3

**Q.29** Which of the following conditions does a reversible process NOT fulfil?

- Ans**
- ✓ 1.

In a reversible process heat transfer should take place with finite temperature difference.

✗ 2.

In a reversible process energy transfer as heat and work during the forward process should be equal to energy transfer as heat and work during the reversal of process.

✗ 3.

A reversible process must proceed in a series of equilibrium states.

✗ 4.

A reversible process should not involve friction of any kind.

Question ID : 630680178729

Status : Answered

Chosen Option : 1

**Q.30** Determine Young's modulus for a column material that has critical stress 316.1 MPa and slenderness ratio 80. The end condition of the column is 'both ends hinged'.

- Ans** ☒ 1. 205 GPa  
☒ 2. 410 GPa  
☒ 3. 100 GPa  
☒ 4. 80 GPa

Question ID : 630680178789  
 Status : Answered  
 Chosen Option : 3

**Q.31** Which of the following is FALSE about welded joints?

- Ans** ☒ 1. A fillet joint is a joint between two overlapping plates or components.  
☒ 2. A butt joint is a joint between two components lying approximately in the same plane.  
☒ 3. The selection of the types of butt joints depends upon the plate thickness and the reliability.  
☒ 4. A butt joint is also called a lap joint.

Question ID : 630680178780  
 Status : Answered  
 Chosen Option : 4

**Q.32** Which of the following is NOT a desirable property of a core?

- Ans** ☒ 1. High refractoriness  
☒ 2. Core should be less permeable than mould  
☒ 3. Core should disintegrate or collapse shortly  
☒ 4. Core should have good green and dry strength for safe handling

Question ID : 630680178807  
 Status : Answered  
 Chosen Option : 3

**Q.33** Which of the following are advantages of mechanical firing (stokers)?

- A. Large quantities of fuel can be fed into the furnace.  
 B. Poorer grades of fuel can be burnt easily.  
 C. Stokers save coal and increase the efficiency of coal firing.

- Ans** ☒ 1. A and B  
☒ 2. A and C  
☒ 3. B and C  
☒ 4. A, B and C

Question ID : 630680178835  
 Status : Answered  
 Chosen Option : 4

Q.34 Which of the following is INCORRECT regarding fouling factor in heat exchangers?

Ans ☒ 1.

After a period of operation, the heat-transfer surfaces for a heat exchanger may become coated with various deposits present in the flow systems.

☒ 2.

The heat-transfer surfaces of a heat exchanger may become corroded as a result of the interaction between the fluids and the material used for construction of the heat exchanger.

☒ 3. Fouling factor is defined as  $= (1/U_{\text{clean}} - 1/U_{\text{dirty}})$ .

☒ 4.

Fouling factor is included along with the other thermal resistances making up the overall heat-transfer coefficient of heat exchanger.

Question ID : 630680178739

Status : Answered

Chosen Option : 2

Q.35 Which of the following is NOT an outcome of suitably designed gating system?

Ans ☒ 1. Minimised turbulence for flow of molten metal.

☒ 2. Filling of mould in minimum time.

☒ 3. Preventing contaminants to reach mould cavity.

☒ 4. Variable standardised pouring time.

Question ID : 630680178808

Status : Answered

Chosen Option : 4

Q.36 The stresses on two perpendicular planes through a point in a body are 120 MPa (tensile), 30 MPa (tensile) and shear stress of 60 MPa. Find normal stress on plane of maximum shear stress.

Ans ☒ 1. 75 MPa (tensile)

☒ 2. 75 MPa (compressive)

☒ 3. 150 MPa (tensile)

☒ 4. 90 MPa (compressive)

Question ID : 630680178794

Status : Answered

Chosen Option : 3

Q.37 Which of the following is INCORRECT for AutoCAD?

Ans ☒ 1. Zoom in or out can be done by rolling the mouse wheel.

☒ 2.

Pan a view in any direction by holding the wheel down while moving your mouse.

☒ 3.

PLINE command is used to create open or closed polylines.

☒ 4. Object snaps is a command to draw a circle in AutoCAD.

Question ID : 630680178842

Status : Answered

Chosen Option : 4

Q.38 Which of the following terms are associated with Simplex method?

A. Contribution per unit

B. Product mix

C. Row showing the coefficients of constraint equations

Ans ✓ 1. A, B, and C

✗ 2. B and C

✗ 3. A and C

✗ 4. A and B

Question ID : 630680178827

Status : Not Answered

Chosen Option : --

Q.39 Find centre of buoyancy for a wooden block of width 2.5 m and of depth 1.5 m when it floats horizontally in water. The density of wooden block is 650 kg/m<sup>3</sup> and the length is 6 m. The volume of water displaced is 14.625 m<sup>3</sup>.

Ans ✓ 1. 0.4875 m

✗ 2. 0.975 m

✗ 3. 0.2434 m

✗ 4. 0.12 m

Question ID : 630680178744

Status : Answered

Chosen Option : 3

Q.40 Which of the following is NOT an assumption in theory of simple bending?

Ans ✗ 1. The material is homogeneous and isotropic.

✗ 2.

Transverse planes remain plane and perpendicular after bending.

✗ 3.

The stress concentration effects near the concentrated loads are neglected.

✓ 4.

The material has different value of Young's modulus in tension and compression.

Question ID : 630680178785

Status : Answered

Chosen Option : 4

Q.41 A tension bar is tapering from (D + A) diameter to (D - A) diameter. What is the value of percentage error involved in using the average diameter to calculate the Young's modulus?

Ans ✗ 1. 10 A/D

✗ 2. (10 D/A)<sup>2</sup>

✗ 3. 10 A/D<sup>2</sup>

✓ 4. (10 A/D)<sup>2</sup>

Question ID : 630680178792

Status : Answered

Chosen Option : 3

**Q.42** A plate clutch has one pair of contacting surfaces. Friction disk's inner diameter and outer diameter are 100 mm and 200 mm, respectively. Allowable pressure intensity is  $1 \text{ N/mm}^2$  and coeff. of friction is 0.2. Using uniform wear theory find total operating force.

- Ans** ☒ 1. 15.7 kN  
☒ 2. 30.14 kN  
☒ 3. 7.85 kN  
☒ 4. 10 kN

Question ID : 630680178782  
 Status : Answered  
 Chosen Option : 1

**Q.43** Which of the following are functions of inventory?

- A. To maintain efficient production flow  
 B. To reduce the effects of changes in prices and supply  
 C. To get the discount benefits in prices of raw material

- Ans** ☒ 1. A, B, and C  
☒ 2. A and B  
☒ 3. B and C  
☒ 4. A and C

Question ID : 630680178821  
 Status : Answered  
 Chosen Option : 2

**Q.44** Which of the following explains moving average method of forecasting?

- Ans** ☒ 1. Forecast is linear, exponential, or other projection MR-LR L of past trend.  
☒ 2. Forecast is average of 'n' most recent periods.  
☒ 3. Forecast equals latest value or latest plus or minus SR L some percentage.  
☒ 4. Forecast is an exponentially weighted moving average, SR L, where, latest values carry most weight.

Question ID : 630680178818  
 Status : Answered  
 Chosen Option : 3

Q.45 Which of the following is INCORRECT for load cells?

Ans ☒ 1.

When an elastic member is combined with a strain gauge and used for the measurement of force it is termed a load cell.

☒ 2.

In load cells, elastic members act as secondary transducers and strain gauges as primary transducers.

☒ 3.

In Servo-controlled Dynamometer, the load cell on the dynamometer measures the actual torque from the engine.

☒ 4.

In Differential Transformers an LVDT can be employed in a load cell to measure the applied force.

Question ID : 630680178843

Status : Answered

Chosen Option : 2

Q.46 Which of the following is INCORRECT for prime movers?

Ans ☒ 1.

The prime-mover in the hydraulic power plant converts the energy of water into mechanical energy and further into electrical energy.

☒ 2.

Prime-movers are classified on the basis of the action of water on moving blades.

☒ 3.

In impulse type turbine, the pressure energy of the water is converted into kinetic energy when passed through the nozzle.

☒ 4.

The casing of the reaction turbine operates at atmospheric pressure.

Question ID : 630680178832

Status : Answered

Chosen Option : 4

Q.47 Which of the following factors affect the brake capacity?

A. Unit pressure between breaking surface

B. Contacting area of breaking surface

C. Radius of brake drum

D. The coefficient of friction

Ans ☒ 1. B, C, and D

☒ 2. A, B, and D

☒ 3. A, B, C, and D

☒ 4. A, B, and C

Question ID : 630680178781

Status : Answered

Chosen Option : 3

Q.48 Which of the following criteria are used to classify Weirs?

- A. Shape of opening
- B. Shape of crest
- C. Effect of sides on nappe

Ans ☒ 1. A, B, and C  
☒ 2. B and C  
☒ 3. A and C  
☒ 4. A and B

Question ID : 630680178748  
Status : Answered  
Chosen Option : 2

Q.49 Which of the following are methods of expression of tool life?

- A. Time period between two successive grindings of the tool.
- B. No. of components machined between two successive grindings of the tool.
- C. Volume of the metal removed between two successive grindings of the tool.

Ans ☒ 1. A and B  
☒ 2. B and C  
☒ 3. A and C  
☒ 4. A, B and C

Question ID : 630680178813  
Status : Answered  
Chosen Option : 4

Q.50 Calculate maximum NTU of a heat exchanger, if the overall heat-transfer coefficient is  $275 \text{ W/m}^2 \cdot ^\circ\text{C}$ , the surface area of the heat exchanger is  $10.82 \text{ m}^2$  and  $C_{\min}$  is  $1380 \text{ W/}^\circ\text{C}$ .

Ans ☒ 1. 4.3  
☒ 2. 2.156  
☒ 3. 1.07  
☒ 4. 8.6

Question ID : 630680178741  
Status : Not Answered  
Chosen Option : --

Q.51 Which of the following is INCORRECT for frequency response analysis?

Ans ☒ 1.

The Nyquist criterion relates the stability of a closed-loop system to the open-loop frequency response.

☒ 2.

Knowledge of the open-loop system's frequency response yields information about the stability of the closed-loop system.

☒ 3.

Frequency response techniques are an alternate approach to the root locus.

☒ 4.

The Nyquist criterion does not relate the stability of a closed-loop system to open-loop pole location.

Question ID : 630680178841

Status : Not Answered

Chosen Option : --

Q.52 Which of the following is INCORRECT for plastics?

Ans ☒ 1. Plastics are synthetic materials

☒ 2. Plastics are moulded into desired shape under pressure.

☒ 3. Plastics are resistant to corrosion.

☒ 4. Plastics have low dimensional stability.

Question ID : 630680178804

Status : Answered

Chosen Option : 4

Q.53 Which of the following is FALSE when we compare welded structures and cast iron structures?

Ans ☒ 1.

Welded structures made of mild steel plates are lighter in weight than cast iron structures.

☒ 2.

Welded structures sometimes require stress relieving heat treatment while cast structures do not require such stress relieving treatment.

☒ 3.

Welded assemblies are more easily machined than cast structures.

☒ 4.

As compared with cast iron structures the capacity of welded structure to damp vibration is better.

Question ID : 630680178779

Status : Answered

Chosen Option : 4

Q.54 If useful work done in a Rankine cycle is 840 kJ/kg, then find specific steam consumption.

Ans ☒ 1. 4.286 kg/kWh

☒ 2. 8.56 kg/kWh

☒ 3. 1.14 kg/kWh

☒ 4. 17.2 kg/kWh

Question ID : 630680178726

Status : Answered

Chosen Option : 1

Q.55 Which of the following does NOT have FCC crystal structure?

- Ans
- ☒ 1. Aluminium
  - ☒ 2. Copper
  - ☒ 3. Gold
  - ☒ 4. Cobalt

Question ID : 630680178797

Status : Answered

Chosen Option : 4

Q.56 A nozzle expands adiabatically air from 8 bar and 500 K to 5 bar and 455 K. The temperature would be 450 K if the expansion had been isentropic. Find the nozzle efficiency.

- Ans
- ☒ 1. 45%
  - ☒ 2. 90%
  - ☒ 3. 85%
  - ☒ 4. 40%

Question ID : 630680178761

Status : Not Answered

Chosen Option : --

Q.57 Which of the following rules allow us to sketch the root locus using minimal calculations?

- A. The root locus is non symmetrical about Real axis.
- B. Location of Real axis segments of root locus.
- C. Defining number of branches.

- Ans
- ☒ 1. B and C
  - ☒ 2. A and B
  - ☒ 3. A and C
  - ☒ 4. A, B and C

Question ID : 630680178840

Status : Answered

Chosen Option : 4

Q.58 Which of the following is/are correct in case of transportation problems with unequal demand and supply?

- A. Dummy entities are introduced.
- B. Extra demand (or supply) is removed.
- C. Such problems cannot be solved.

- Ans
- ☒ 1. A only
  - ☒ 2. B only
  - ☒ 3. C only
  - ☒ 4. A and B

Question ID : 630680178823

Status : Answered

Chosen Option : 4

Q.59 Find the displacement thickness for velocity distribution in the boundary layer given by  $u/U = y/\delta$ .

- Ans
- ☐ 1.  $2\delta$
  - ☐ 2.  $\delta/4$
  - ☐ 3.  $\delta$
  - ☒ 4.  $\delta/2$

Question ID : 630680178750

Status : Answered

Chosen Option : 4

Q.60 Which of the following is INCORRECT?

- Ans
- ☐ 1. Two dimensional linear programming problems can be easily and rapidly solved by graphical method.
  - ☒ 2. Operations research was originated during the First World War.
  - ☐ 3. Transportation method is useful in the problem of distribution of goods.
  - ☐ 4. Simplex method is one of the linear programming methods.

Question ID : 630680178822

Status : Answered

Chosen Option : 2

Q.61 Which of the following is an INCORRECT statement?

- Ans
- ☐ 1. Silicon as an impurity in cast iron makes the iron soft and easily machinable.
  - ☐ 2. Sulphur as an impurity in cast iron makes the iron hard and brittle.
  - ☐ 3. Manganese as an impurity in cast iron makes the iron white and hard.
  - ☒ 4. Phosphorus as an impurity in cast iron reduces brittleness.

Question ID : 630680178803

Status : Answered

Chosen Option : 3

Q.62 Identify the INCORRECT statement.

- Ans
- ☒ 1. The gyroscopes are installed in ships in order to maximise the rolling and pitching effects of waves.
  - ☐ 2. The gyroscopic couple is usually applied through the bearings which support the shaft.
  - ☐ 3. In case of rolling of a ship, the axis of precession (i.e. longitudinal axis) is always parallel to the axis of spin for all positions.
  - ☐ 4. If the axis of precession becomes parallel to the axis of spin, there will be no effect of the gyroscopic couple acting on the body of the ship.

Question ID : 630680178773

Status : Answered

Chosen Option : 2

**Q.63** The calculations for the Heisler charts are performed by truncating the infinite series solutions for the problems into a few terms. This restricts the applicability of the charts to values of the Fourier number greater than which of the following values?

- Ans
- ☒ 1. Fourier number  $> 0.4$
  - ☒ 2. Fourier number  $> 0.1$
  - ☒ 3. Fourier number  $> 0.2$
  - ☒ 4. Fourier number  $> 0.3$

Question ID : **630680178738**  
Status : **Answered**  
Chosen Option : 2

**Q.64** Which of the following are correct pairs?

- A. Rigid link – Wire rope
- B. Flexible link – Belt
- C. Fluid link – Hydraulic press

- Ans
- ☒ 1. B and C
  - ☒ 2. A, B and C
  - ☒ 3. A and B
  - ☒ 4. A and C

Question ID : **630680178767**  
Status : **Answered**  
Chosen Option : 1

**Q.65** Which of the following is INCORRECT for the factors affecting tool life?

- Ans
- ☒ 1. Higher the cutting speed smaller the tool life.
  - ☒ 2. Higher the feed or depth of cut smaller the tool life.
  - ☒ 3. Large relief angle gives stronger tool.
  - ☒ 4. Higher the toughness of a tool material longer the tool life.

Question ID : **630680178816**  
Status : **Answered**  
Chosen Option : 3

**Q.66** Identify the INCORRECT statement about cams.

- Ans
- ☒ 1. Base circle is the smallest circle that can be drawn to the cam profile.
  - ☒ 2. Prime circle is the largest circle that can be drawn from the centre of the cam and tangent to the pitch curve.
  - ☒ 3. Pitch point is a point on the pitch curve having the maximum pressure angle.
  - ☒ 4. Lift or stroke is the maximum travel of the follower from its lowest position to the topmost position.

Question ID : **630680178771**  
Status : **Answered**  
Chosen Option : 2

**Q.67** A 750 mm diameter pipe carries water under a head of 60 m. The allowable stress for the material of the pipe is 20 N/mm<sup>2</sup>. Determine the thickness of the pipe.

- Ans**
- ✓ 1. 11 mm
  - ✗ 2. 22 mm
  - ✗ 3. 5.5 mm
  - ✗ 4. 33 mm

Question ID : 630680178786

Status : Answered

Chosen Option : 2

**Q.68** Find the operating bearing pressure in a journal bearing if length to diameter ratio is 1, journal diameter 100 mm and the external load is 9 kN.

- Ans**
- ✗ 1. 0.09 N/mm<sup>2</sup>
  - ✓ 2. 0.9 N/mm<sup>2</sup>
  - ✗ 3. 2.9 N/mm<sup>2</sup>
  - ✗ 4. 1.9 N/mm<sup>2</sup>

Question ID : 630680178777

Status : Answered

Chosen Option : 2

**Q.69** Which of the following does NOT have BCC crystal structure?

- Ans**
- ✓ 1. Gold
  - ✗ 2. Tungsten
  - ✗ 3. Chromium
  - ✗ 4. Molybdenum

Question ID : 630680178795

Status : Answered

Chosen Option : 1

**Q.70** If the optimistic time is  $t_o$ , most likely time is  $t_m$  and pessimistic time is  $t_p$ , latest finish time  $t_f$ , then which of the following is expected time  $t_e$ ?

- Ans**
- ✗ 1.  $t_e = (t_o + t_f + t_m)/3$
  - ✗ 2.  $t_e = (t_p + 4t_f + t_m)/6$
  - ✓ 3.  $t_e = (t_o + 4t_m + t_p)/6$
  - ✗ 4.  $t_e = (t_o + t_p + t_m)/3$

Question ID : 630680178826

Status : Answered

Chosen Option : 3

Q.71 Which of the following is INCORRECT for network techniques?

Ans ☒ 1. Total float can be negative.

☒ 2.

The independent float is not reduced by delaying previous activity.

☒ 3.

Independent float, if turns out to be negative is taken as zero.

☒ 4.

If an activity is delayed by the free float period, then the succeeding activity will be delayed.

Question ID : 630680178825

Status : Answered

Chosen Option : 2

Q.72 From the point of view of composition and structure, in which of the following groups are ceramics classified?

A. Amorphous

B. Crystalline

C. Bonded

Ans ☒ 1. A and B

☒ 2. B and C

☒ 3. A and C

☒ 4. A, B and C

Question ID : 630680178802

Status : Answered

Chosen Option : 4

Q.73 Which of the following statements is INCORRECT regarding viscosity?

Ans ☒ 1.

The viscosity of liquids decreases with the increase of temperature.

☒ 2.

The viscosity of gases increases with the increase of temperature.

☒ 3. Newtonian fluid does not have viscosity.

☒ 4. Ideal fluid does not have viscosity.

Question ID : 630680178754

Status : Answered

Chosen Option : 3

Q.74 Which of the following is NOT an inversion of double slider crank chain?

Ans ☒ 1. Whitworth quick return motion mechanism

☒ 2. Elliptical trammels

☒ 3. Scotch yoke mechanism

☒ 4. Oldham's coupling

Question ID : 630680178766

Status : Answered

Chosen Option : 1

**Q.75** Which of the following statements is INCORRECT for continuity equation?

**Ans** ☒ 1.

The continuity equation is based on the principle of conservation of mass.

☒ 2.

Continuity equation for a fluid flowing through a pipe is:  $\rho_1 A_1 V_1 = \rho_2 A_2 V_2$ .

☒ 3.

For a two-dimensional flow the continuity equation is  $\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y}$ .

☒ 4.

Continuity equation is not applicable to incompressible flows.

Question ID : 630680178747

Status : Answered

Chosen Option : 4

**Q.76** Find the energy thickness for velocity distribution in the boundary layer given by  $u/U = y/\delta$ .

**Ans** ☒ 1.  $2\delta$

☒ 2.  $\delta/4$

☒ 3.  $\delta$

☒ 4.  $\delta/2$

Question ID : 630680178751

Status : Answered

Chosen Option : 2

**Q.77** The stresses on two perpendicular planes through a point in a body are 30 MPa (tensile), 15 MPa (tensile) and shear stress of 25 MPa. Find major and minor principal stresses, respectively.

**Ans** ☒ 1. 48.6 MPa (tensile), 3.6 MPa (compressive)

☒ 2. 48.6 MPa (compressive), 3.6 MPa (compressive)

☒ 3. 48.6 MPa (tensile), 3.6 MPa (tensile)

☒ 4. 48.6 MPa (compressive), 3.6 MPa (tensile)

Question ID : 630680178793

Status : Answered

Chosen Option : 1

**Q.78** A multi disc clutch has power transmission capacity as 9.37 kW at 750 rpm. Friction disk's inner diameter and outer diameter are 75 mm and 150 mm, respectively. Allowable pressure intensity is  $0.3 \text{ N/mm}^2$  and coeff. of friction is 0.1. Using uniform wear theory, find the number of disks.

**Ans** ☒ 1. 11

☒ 2. 9

☒ 3. 7

☒ 4. 5

Question ID : 630680178783

Status : Answered

Chosen Option : 2

**Q.79** Which of the following are considered for selection of cutting tool materials?

- A. Hot hardness
- B. Wear resistance
- C. Thermal conductivity

**Ans** ☒ 1. A and B  
☒ 2. B and C  
☒ 3. A and C  
☒ 4. A, B and C

Question ID : **630680178814**  
 Status : **Answered**  
 Chosen Option : **4**

**Q.80** Which of the following is an INCORRECT statement?

**Ans** ☒ 1. 'Available energy' is the maximum portion of energy that could be converted into useful work by ideal processes.  
☒ 2. 'Available energy' is not a property of system.  
☒ 3. The available energy (AE) supplied is the maximum work output obtainable from a certain heat input in a cyclic heat engine.  
☒ 4. Available energy denotes the latent capability of energy to do work, and it can be applied to energy in the system or in the surroundings.

Question ID : **630680178730**  
 Status : **Answered**  
 Chosen Option : **4**

**Q.81** A mild steel rod of 12 mm diameter is subjected to tensile test and the gauge length is 65 mm. The observations are: Yield load = 34 kN, Ultimate load = 68 kN, Final diameter = 7mm and Final length = 79 mm. Calculate yield stress.

**Ans** ☒ 1.  $301 \text{ N/mm}^2$   
☒ 2.  $602 \text{ N/mm}^2$   
☒ 3.  $150.5 \text{ N/mm}^2$   
☒ 4.  $75 \text{ N/mm}^2$

Question ID : **630680178787**  
 Status : **Answered**  
 Chosen Option : **2**

**Q.82** From a Nichols chart, which of the following frequency response specifications are used to design a desired time response?

- A. Phase margin
- B. Gain margin
- C. Closed-loop bandwidth
- D. Closed-loop peak amplitude

**Ans** ✓ 1. A, B, C, and D

✗ 2. A, B, and C

✗ 3. A, C, and D

✗ 4. B, C, and D

Question ID : 630680178839  
Status : Answered  
Chosen Option : 1

**Q.83** Which of the following is NOT a Weir, according to the shape of the opening?

**Ans** ✗ 1. Rectangular weir

✗ 2. Triangular weir

✗ 3. Cipolletti weir

✓ 4. Stepped weir

Question ID : 630680178749  
Status : Answered  
Chosen Option : 4

**Q.84** Identify the INCORRECT statement for heat transfer through fins.

**Ans** ✓ 1. Fins always increase heat transfer rate.

✗ 2.

If the value of convection coefficient is large the fin may produce a reduction in heat transfer rate.

✗ 3.

Fin efficiency is ratio of actual heat transferred and heat that would be transferred if entire fin area was at base temperature.

✗ 4.

In practical applications, fins may have varying cross-sectional areas.

Question ID : 630680178737  
Status : Answered  
Chosen Option : 2

**Q.85** Identify the INCORRECT statement about gears.

**Ans** ☒ 1.

Pressure angle is the angle between the common normal to two gear teeth at the point of contact and the common tangent at the pitch point.

☒ 2. Pressure angle is also known as angle of obliquity.

☒ 3.

Dedendum circle is the circle drawn through the bottom of the teeth.

☒ 4.

Circular pitch is the distance measured along the diameter of the pitch circle.

Question ID : 630680178769

Status : Answered

Chosen Option : 2

**Q.86** Which of the following is an INCORRECT statement for precision?

**Ans** ☒ 1.

Precision is the degree of repetitiveness of the measuring process.

☒ 2.

Precision indicates quality of measurement, without giving any assurance that the measurement is correct.

☒ 3. Precision is associated with a set of measurements.

☒ 4. Precision and accuracy can be used interchangeably.

Question ID : 630680178844

Status : Answered

Chosen Option : 4

**Q.87** Which of the following is NOT a reason to quench ash before handling?

**Ans**

☒ 1. Quenching reduces the temperature of ash.

☒ 2. Quenching reduces the corrosive action of ash.

☒ 3. Quenching disintegrates clinkers.

☒ 4. Quenching increases the dust accompanying the ash.

Question ID : 630680178836

Status : Answered

Chosen Option : 2

**Q.88** Which of the following is INCORRECT for penstocks?

**Ans** ☒ 1.

Water hammer is the sudden rise in pressure in the penstock due to the shutting off of the water to the turbine.

☒ 2.

The use of the surge tank is to avoid water hammer in the penstock.

☒ 3.

The water hammer effect with the Francis is less troublesome than the Pelton turbine.

☒ 4.

In the valve house, the butterfly valves or the sluice type valves control the water flow in the penstocks.

Question ID : 630680178831

Status : Answered

Chosen Option : 3

Q.89 Which of the following is an INCORRECT statement for governors?

Ans ☒ 1.

Sleeve lift is the vertical distance which the sleeve travels due to change in equilibrium speed.

☒ 2.

Mean equilibrium speed is the speed at the maximum radius of rotation of the balls.

☒ 3.

Height of a governor is the vertical distance from the centre of the ball to a point where the axes of the arms intersect on the spindle axis.

☒ 4.

Equilibrium speed is the speed at which the governor balls, arms, etc., are in equilibrium and the sleeve does not tend to move upwards or downwards.

Question ID : 630680178772

Status : Answered

Chosen Option : 4

Q.90 Find critical radius of insulation for a material with  $k = 0.17 \text{ W/m} \cdot ^\circ\text{C}$  surrounding a pipe and exposed to room air at  $25^\circ\text{C}$  with  $h = 3.0 \text{ W/m}^2 \cdot ^\circ\text{C}$ .

Ans ☒ 1. 5.67 cm

☒ 2. 5.1 cm

☒ 3. 10.2 cm

☒ 4. 3 cm

Question ID : 630680178735

Status : Answered

Chosen Option : 2

Q.91 Which of the following is INCORRECT?

Ans ☒ 1.

Ductility is a measure of the degree of plastic deformation that has been sustained at fracture.

☒ 2.

Ductility may be expressed quantitatively as either percent elongation or per cent reduction in area.

☒ 3.

For metals the point of yielding may be determined as the initial departure from linearity of the stress-strain curve.

☒ 4.

On stress strain curve proportional limit occurs after yield point.

Question ID : 630680178799

Status : Answered

Chosen Option : 4

Q.92 Which of the following is FALSE for air refrigeration systems?

Ans ☒ 1.

It is cheaper as air is easily available as compared to the other refrigerants.

☒ 2. There is no risk of fire.

☒ 3.

As compared to the other refrigeration systems the weight of air refrigeration system per tonne of refrigeration is high.

☒ 4. This system is employed in aircrafts.

Question ID : 630680178733

Status : Answered

Chosen Option : 3

**Q.93** Air at  $25^{\circ}\text{C}$  blows over a hot plate  $100 \times 37.5$  cm maintained at  $255^{\circ}\text{C}$ . The convection heat-transfer coefficient is  $25 \text{ W/m}^2 \cdot ^{\circ}\text{C}$ . Calculate the heat transfer.

- Ans
- ☒ 1. 4.312 kW
  - ☒ 2. 2.156 kW
  - ☒ 3. 1.078 kW
  - ☒ 4. 8.624 kW

Question ID : 630680178736

Status : Answered

Chosen Option : 1

**Q.94** Which of the following expressions is true for filling time for the mould?

- Ans
- ☒ 1. Volume of mould / (Gate area  $\times$  Velocity of metal at gate)
  - ☒ 2. Volume of mould  $\times$  Gate area  $\times$  Velocity of metal at gate
  - ☒ 3. Volume of mould / (Gate area + Velocity of metal at gate)
  - ☒ 4. Volume of mould / (Gate area – Velocity of metal at gate)

Question ID : 630680178809

Status : Answered

Chosen Option : 1

**Q.95** Determine the power developed in a reaction turbine if mass flow is 10 kg/s, blade speed is 20 m/s and change in velocity of whirl is 150 m/s.

- Ans
- ☒ 1. 20 kW
  - ☒ 2. 30 kW
  - ☒ 3. 15 kW
  - ☒ 4. 60 kW

Question ID : 630680178759

Status : Answered

Chosen Option : 2

**Q.96** Find the loss of head due to sudden enlargement in pipe where the velocity is changing (suddenly due to enlargement) from 7.96 m/s at one section to 1.99 m/s to other section of the pipe.

- Ans
- ☒ 1. 3.6 m of water
  - ☒ 2. 0.9 m of water
  - ☒ 3. 5.4 m of water
  - ☒ 4. 1.8 m of water

Question ID : 630680178752

Status : Answered

Chosen Option : 4

Q.97 Which of the following are NOT organic polymers?

- Ans
- ☒ 1. Carbonates
  - ☒ 2. Sulphonates
  - ☒ 3. Silicones
  - ☒ 4. Aldehydes

Question ID : 630680178800

Status : Answered

Chosen Option : 4

Q.98 Which of the following methods is/are used to assess random errors?

- Ans
- ☒ 1. Experimental methods
  - ☒ 2. By performing sensitivity analysis
  - ☒ 3. Empirical methods
  - ☒ 4. Statistical methods

Question ID : 630680178845

Status : Answered

Chosen Option : 3

Q.99 Which of the following properties are considerable for metal powder to make it suitable for powder metallurgy?

- A. Particle shape
- B. Flowability
- C. Sintering ability

- Ans
- ☒ 1. A and B
  - ☒ 2. B and C
  - ☒ 3. A and C
  - ☒ 4. A, B and C

Question ID : 630680178806

Status : Answered

Chosen Option : 4

Q.100 Choking of a nozzle fitted to a pressure tank containing gas implies:

- A. Sonic velocity at the throat
- B. The mass flow rate is maximum
- C. Obstruction of flow

- Ans
- ☒ 1. A, B and C
  - ☒ 2. B and C only
  - ☒ 3. A and B only
  - ☒ 4. A and C only

Question ID : 630680178763

Status : Answered

Chosen Option : 3

**Q.101** A nozzle expands air from 8 bar and 540 K to 5.8 bar and 495 K. Find the velocity of air at exit if specific heat at constant pressure is 1.005 kJ/kgK.

- Ans**
- ✓ 1. 300 m/s
  - ✗ 2. 400 m/s
  - ✗ 3. 200 m/s
  - ✗ 4. 100 m/s

Question ID : 630680178762

Status : Answered

Chosen Option : 2

**Q.102** Which of the following is INCORRECT for polymers?

- Ans**
- ✓ 1. Polyethylene is a nonlinear polymer.
  - ✗ 2. Nylons are engineering thermoplastic.
  - ✗ 3. Thermoplastics are made by polymerising together monomers to form long chains.
  - ✗ 4. Polycarbonates have a 'ring' structure in the chain.

Question ID : 630680178805

Status : Answered

Chosen Option : 1

**Q.103** Identify the INCORRECT statement for balancing of reciprocating engine mechanism.

- Ans**
- ✗ 1. Secondary unbalanced force is  $1/n$  times the maximum primary unbalanced force.
  - ✗ 2. In case of moderate speeds, the secondary unbalanced force is so small that it may be neglected as compared to primary unbalanced force.
  - ✗ 3. The primary unbalanced force is maximum, when  $\theta = 0^\circ$  or  $180^\circ$ , where,  $\theta$  is angle of inclination of the crank with the line of stroke.
  - ✓ 4. The secondary unbalanced force is minimum, when  $\theta = 0^\circ, 90^\circ, 180^\circ$  and  $360^\circ$ .

Question ID : 630680178774

Status : Answered

Chosen Option : 2

**Q.104** In an IC engine, during the compression stroke the heat rejected to the cooling water is 40 kJ/kg and the work input is 90 kJ/kg. Calculate the change in internal energy of the working fluid.

- Ans**
- ✗ 1. 130 kJ/kg
  - ✓ 2. 50 kJ/kg
  - ✗ 3. -50 kJ/kg
  - ✗ 4. -130 kJ/kg

Question ID : 630680178728

Status : Answered

Chosen Option : 2

**Q.105** A cylindrical riser is to be designed for a steel plate casting of size  $300 \times 180 \times 20$  mm. The ratio of casting volume to riser volume is 5. Find the diameter of the riser if the height and diameter of riser are equal.

- Ans
- ☒ 1. 130 mm
  - ☒ 2. 65 mm
  - ☒ 3. 30 mm
  - ☒ 4. 100 mm

Question ID : 630680178810

Status : Answered

Chosen Option : 3

**Q.106** Which of the following is INCORRECT for reaction turbine?

- Ans
- ☒ 1. The degree of reaction is a parameter that describes the relation between the energy transfer due to static pressure change and the energy transfer due to dynamic pressure change.
  - ☒ 2. The degree of reaction is define as the ratio of the static pressure drop in the rotor do the static pressure drop in that stage.
  - ☒ 3. The degree of reaction is define as the ratio of the static enthalpy drop in the rotor to the static enthalpy drop in the stage.
  - ☒ 4. In a reaction turbine total-to-static efficiency does not depend upon reaction ratio.

Question ID : 630680178758

Status : Answered

Chosen Option : 4

**Q.107** Which of the following are the components of a block diagram for a linear time invariant system?

- A. Signals
- B. System
- C. Summing junction
- D. Pickoff point

- Ans
- ☒ 1. A, B, C, and D
  - ☒ 2. A, B, and C
  - ☒ 3. A, C, and D
  - ☒ 4. B, C, and D

Question ID : 630680178838

Status : Answered

Chosen Option : 1

**Q.108** Find the mass of a flywheel of an engine, if coefficient of fluctuation of speed is 0.01, maximum fluctuation of energy is 20000 N-m, mean angular speed is 9.426 rad/s and radius of gyration is 2 metres.

- Ans
- ☒ 1. 5630 kg
  - ☒ 2. 2815 kg
  - ☒ 3. 11260 kg
  - ☒ 4. 1407 kg

Question ID : 630680178768

Status : Answered

Chosen Option : 4

Q.109 Which of the following is INCORRECT for Miller indices?

Ans ☒ 1.

Miller indices is a set of three integers (four for hexagonal) that designate crystallographic plane.

☒ 2.

Miller indices are determined from reciprocals of fractional axial intercepts.

☒ 3.

For a given crystal structure, planes having identical atomic packing yet different Miller indices belong to the same family.

☒ 4. Interplanar spacing is not related with the Miller indices.

Question ID : 630680178798

Status : Answered

Chosen Option : 4

Q.110 Which of the following machine tools employs single point cutting tool?

Ans ☒ 1. Drill

☒ 2. Milling cutter

☒ 3. Reamers

☒ 4. Slotter

Question ID : 630680178815

Status : Answered

Chosen Option : 4

Q.111 Which of the following are desirable characteristics of thermal power plant?

A. Ability to burn coal especially of high ash content

B. Reduced water requirement

C. Reduced reliability and availability

Ans ☒ 1. A and B

☒ 2. A and C

☒ 3. B and C

☒ 4. A, B and C

Question ID : 630680178834

Status : Answered

Chosen Option : 1

Q.112 Which of the following machine tools employs multi point cutting tool?

Ans ☒ 1. Lathe

☒ 2. Shaper

☒ 3. Planer

☒ 4. Broaches

Question ID : 630680178812

Status : Answered

Chosen Option : 4

**Q.113** Determine LMTD, if the heat transfer area is  $63.5 \text{ m}^2$ , the rate of heat flow is 700 kW, overall heat transfer coeff. is 580  $\text{W/m}^2\text{K}$ , correction factor is 1.

- Ans ☒ 1. 19 K  
☒ 2. 38 K  
☒ 3. 9.5 K  
☒ 4. 57 K

Question ID : 630680178740  
Status : Answered  
Chosen Option : 3

**Q.114** Which of the following is/are INCORRECT for model testing of turbine unit?

- A. The model and prototype should be identical in shape.  
B. Casing, guide mechanism and draft tubes must be also geometrically similar.  
C. Unit power, unit discharge and unit speed are used for model testing.

- Ans ☒ 1. A, B, and C  
☒ 2. B and C  
☒ 3. C only  
☒ 4. A and B

Question ID : 630680178833  
Status : Answered  
Chosen Option : 4

**Q.115** Which of the following is FALSE for actual gas turbine operating on open cycle?

- Ans ☒ 1.  
If the turbine inlet-temperature (with the other variables being constant) of an open cycle gas turbine power plant is increased its thermal efficiency is improved.  
☒ 2.  
With the decrease in the compressor inlet temperature there is increase in thermal efficiency.  
☒ 3.  
For a given turbine inlet temperature, as the pressure ratio increases, the heat supplied as well as the heat rejected are increased.  
☒ 4.  
As the pressure ratio increases, the thermal efficiency also increases until it becomes maximum and then it drops off.

Question ID : 630680178731  
Status : Answered  
Chosen Option : 1

**Q.116** A steel plate 120 mm wide and 10 mm thick is bent into a circular arc and the stress induced is 125 MPa. Determine the radius of the circular arc. Young's modulus is 200 GPa.

- Ans ☒ 1. 12 m  
☒ 2. 8 m  
☒ 3. 16 m  
☒ 4. 10 m

Question ID : 630680178784  
Status : Answered  
Chosen Option : 2

Q.117 Which of the following is an INCORRECT statement for feedback control systems?

Ans ☒ 1.

Frequency-domain technique is based on converting a system's differential equation to a transfer function.

☒ 2.

Frequency-domain technique can be applied only to linear, time-invariant systems.

☒ 3.

The state-space approach can be used to represent nonlinear systems.

☒ 4.

The frequency-domain technique can handle systems with nonzero initial conditions.

Question ID : 630680178837

Status : Answered

Chosen Option : 3

Q.118 Which of the following is INCORRECT for Zirconia?

Ans ☒ 1. Zirconia is a hard refractory material.

☒ 2. Zirconia is useful in high temperature furnace.

☒ 3. Zirconia is a polymorphic compound.

☒ 4. Zirconia exists only in one crystalline phase.

Question ID : 630680178801

Status : Answered

Chosen Option : 3

Q.119 Which of the following is FALSE for entropy?

Ans ☒ 1.

Entropy is a function of a quantity of heat which shows the possibility of conversion of that heat into work.

☒ 2.

The increase in entropy is small when heat is added at a low temperature.

☒ 3.

For maximum entropy, there is minimum availability for conversion into work.

☒ 4.

When a system is at zero absolute temperature, the entropy of system is zero.

Question ID : 630680178732

Status : Answered

Chosen Option : 3

Q.120 Identify the INCORRECT statement about gears trains.

Ans ☒ 1.

When there is only one gear on each shaft, it is known as simple gear train.

☒ 2.

When there are more than one gear on a shaft, is called a compound train of gear.

☒ 3.

When the axes of the first gear (i.e. first driver) and the last gear (i.e. last driven or follower) are perpendicular, then the gear train is known as reverted gear train.

☒ 4.

In an epicyclic gear train, the axes of the shafts, over which the gears are mounted, may move relative to a fixed axis.

Question ID : 630680178770

Status : Answered

Chosen Option : 3

Section : General Aptitude

Q.1 Successive discounts of 10% and 15% are given on the purchase of a wrist watch. If the price of the watch is ₹3,450, find the selling price.

- Ans
- ☒ 1. ₹2,369.25
  - ☒ 2. ₹2,639.25
  - ☒ 3. ₹2,693.25
  - ☒ 4. ₹2,639.75

Question ID : 63068070792  
Status : Answered  
Chosen Option : 3

Q.2 As per the census of India, which of the following age-groups is economically productive?

- Ans
- ☒ 1. 15 to 59 years
  - ☒ 2. 16 to 45 years
  - ☒ 3. 15 to 70 years
  - ☒ 4. 15 to 45 years

Question ID : 63068080457  
Status : Answered  
Chosen Option : 2

Q.3 Which is the largest mangrove forest in the India?

- Ans
- ☒ 1. Bhitarkanika Mangrove
  - ☒ 2. Godavari-Krishna Mangrove
  - ☒ 3. Sundarbans Mangrove
  - ☒ 4. Pichavaram Mangrove

Question ID : 63068069440  
Status : Answered  
Chosen Option : 3

Q.4 The ratio of incomes of Anil and Sunil is 5 : 6. The ratio of their expenditures is 3 : 4. Find the ratio of their savings if the savings of Anil is one-fourth of his income.

- Ans
- ☒ 1. 5 : 4
  - ☒ 2. 4 : 3
  - ☒ 3. 1 : 2
  - ☒ 4. 3 : 2

Question ID : 630680102960  
Status : Answered  
Chosen Option : 2

Q.5 The quality of \_\_\_\_\_ is increased when milk converts to curd by lactic acid bacteria.

- Ans
- ☒ 1. vitamin B12
  - ☒ 2. vitamin D3
  - ☒ 3. vitamin E
  - ☒ 4. vitamin C

Question ID : 63068078581  
Status : Answered  
Chosen Option : 4

Q.6 Select the most appropriate option to fill in the blank.

The word \_\_\_\_\_ is NOT a synonym of 'benevolent'.

- Ans ☒ 1. malevolent  
☒ 2. benign  
☒ 3. generous  
☒ 4. philanthropic

Question ID : 630680129804  
Status : Answered  
Chosen Option : 2

Q.7 Parts of a sentence are given below in jumbled order. Arrange the parts in the correct order to form a meaningful sentence.  
(P) engaged in agriculture still remains  
(Q) to 70 per cent during 1951  
(R) at around 60 per cent compared  
(S) in India as a whole, the share of labour force

- Ans ☒ 1. SPRQ  
☒ 2. PQRS  
☒ 3. QSRP  
☒ 4. RPSQ

Question ID : 63068086328  
Status : Answered  
Chosen Option : 1

Q.8 Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:  
All cafeterias are skeletons.  
Some skeletons are drums.  
Some drums are apricots.

Conclusions:  
(I) Some drums are skeletons.  
(II) All skeletons are cafeterias.  
(III) Some apricots are drums.

- Ans ☒ 1. Only conclusion I follows  
☒ 2. Only conclusion II follows  
☒ 3. Both conclusion I and conclusion III follow  
☒ 4. None of the conclusions follow

Question ID : 630680104970  
Status : Answered  
Chosen Option : 3

Q.9 Which of the given statements is/are true?

(a) Total cost increases at an increased rate when marginal cost is increasing.  
(b) Marginal cost may be rising even when the average cost is falling.

- Ans ☒ 1. Only (a)  
☒ 2. Only (b)  
☒ 3. Both (a) and (b)  
☒ 4. Neither (a) nor (b)

Question ID : 63068068720  
Status : Answered  
Chosen Option : 3

Q.10 \_\_\_\_\_ scheme was launched by the Government of India with an aim to make all national highways free of railway crossings.

- Ans
- ☒ 1. National Highways Development Project
  - ☒ 2. Setu Bharatam
  - ☒ 3. Sagarmala
  - ☒ 4. Golden Quadrilateral Project

Question ID : 630680113737  
Status : Answered  
Chosen Option : 2

Q.11 In a code language, TOWEL is written as 12345 and WELCOME as 3456284. How will LOWE be written in that language?

- Ans
- ☒ 1. 5324
  - ☒ 2. 6543
  - ☒ 3. 3425
  - ☒ 4. 5234

Question ID : 630680107817  
Status : Answered  
Chosen Option : 4

Q.12 Wolfgang Kohler presented the first experimental evidence on insight in the 1920s when he demonstrated the results of his work with Sultan. Who was Sultan?

- Ans
- ☒ 1. A dog
  - ☒ 2. A chimpanzee
  - ☒ 3. An orangutan
  - ☒ 4. Kohler's human assistant

Question ID : 630680178351  
Status : Answered  
Chosen Option : 2

Q.13 7 children A, B, C, D, E, F and H are standing in a row, facing north. H is in the middle of the row and is third to the right of B. E is to the immediate right of B. A is second to the left of F, and is the immediate neighbour of H and D. C is second to the right of B. Who is at the extreme right?

- Ans
- ☒ 1. B
  - ☒ 2. A
  - ☒ 3. D
  - ☒ 4. F

Question ID : 630680143021  
Status : Answered  
Chosen Option : 4

Q.14 Which of the following songs is sung in some parts of Uttar Pradesh at the time of the birth of a son?

- Ans
- ☒ 1. Chhakri
  - ☒ 2. Tappa
  - ☒ 3. Laman
  - ☒ 4. Sohar

Question ID : 630680142993  
Status : Answered  
Chosen Option : 4

Q.15 A man covers a certain distance between his house and office on scooter. If he has an average speed of 15 km/h, he is late by 10 min. However, with a speed of 20 km/h, he reaches his office 5 min earlier. Find the distance between his house and office.

- Ans ☒ 1. 15 km  
☐ 2. 45 km  
☐ 3. 30 km  
☐ 4. 20 km

Question ID : 630680108147  
Status : Answered  
Chosen Option : 2

Q.16 Through which Constitutional Amendment Act were Articles 31 A and 31 B added to the Constitution

- Ans ☐ 1. Fifth  
☐ 2. Third  
☒ 3. First  
☐ 4. Eighth

Question ID : 63068059633  
Status : Answered  
Chosen Option : 3

Q.17 If interest be compounded half-yearly, then find the compound interest on ₹8,000 at the rate of 10% for  $1\frac{1}{2}$  years

- Ans ☐ 1. ₹126.10  
☐ 2. ₹12.61  
☐ 3. ₹12610  
☒ 4. ₹1261

Question ID : 63068094353  
Status : Answered  
Chosen Option : 3

Q.18 A sells an LED bulb for ₹110 and bears a loss of 10%. What should be the selling price (in ₹) to get a 5% profit?

- Ans ☐ 1. 122.33  
☐ 2. 125.33  
☒ 3. 128.33  
☐ 4. 133.33

Question ID : 63068091906  
Status : Answered  
Chosen Option : 2

Q.19 Where are the Five Rathas that are monolithic temples dedicated to the Pandavas and their wife located?

- Ans ☐ 1. Mysuru  
☒ 2. Mahabalipuram  
☐ 3. Hampi  
☐ 4. Bengaluru

Question ID : 630680142990  
Status : Answered  
Chosen Option : 2

Q.20 What is the retirement age of the Chief Justice of India?

- Ans
- ☐ 1. 60 years
  - ☐ 2. 61 years
  - ☐ 3. 62 years
  - ☒ 4. 65 years

Question ID : 630680113318  
Status : Answered  
Chosen Option : 4

Q.21 Convert  $66\frac{2}{3}\%$  to its equivalent ratio:

- Ans
- ☒ 1. 2:3
  - ☐ 2. 3:2
  - ☐ 3. 4:3
  - ☐ 4. 3:4

Question ID : 630680101511  
Status : Answered  
Chosen Option : 1

Q.22 C is the husband of D. O is the eldest son of C and D. N is the wife of the youngest son of C and D. P is the wife of O. M is the father of the only daughter of N. How is M related to O?

- Ans
- ☐ 1. Father
  - ☒ 2. Brother
  - ☐ 3. Son
  - ☐ 4. Wife's brother

Question ID : 63068084153  
Status : Answered  
Chosen Option : 4

Q.23 Sathvika can do a job in 5 days, Ujwal in 4 days, Sathvika, Ujwal and Uma together in 2 days. In what time can Uma do it alone?

- Ans
- ☐ 1. 10 days
  - ☐ 2. 14 days
  - ☐ 3. 17 days
  - ☒ 4. 20 days

Question ID : 630680102897  
Status : Answered  
Chosen Option : 3

Q.24 Select the most appropriate option to fill in the blank.  
We had to slow down \_\_\_\_\_ the ice on the road.

- Ans
- ☒ 1. because of
  - ☐ 2. because
  - ☐ 3. despite of
  - ☐ 4. in spite of

Question ID : 630680132805  
Status : Answered  
Chosen Option : 1

Q.25 The partition of Bengal was revoked in which year?

- Ans
- ☒ 1. 1905
  - ☒ 2. 1911
  - ☒ 3. 1907
  - ☒ 4. 1909

Question ID : 630680113630

Status : Answered

Chosen Option : 3

Q.26 The frustum of a right circular cone has the radii of base and top as 7 cm and 11 cm, respectively. If the height is 9 cm, then find the volume of the frustum.

- Ans
- ☒ 1.  $741\pi\text{ cm}^3$
  - ☒ 2.  $840\pi\text{ cm}^3$
  - ☒ 3.  $950\pi\text{ cm}^3$
  - ☒ 4.  $710\pi\text{ cm}^3$

Question ID : 63068085745

Status : Answered

Chosen Option : 3

Q.27 Which of the following statements is NOT true in respect of leadership?

- Ans
- ☒ 1. Leaders cannot be trained to develop an ability.
  - ☒ 2. Leaders can be trained for a new leadership skill.
  - ☒ 3. Leaders can be trained to develop aptitude.
  - ☒ 4. Leaders cannot be trained to develop traits.

Question ID : 630680178357

Status : Answered

Chosen Option : 2

Q.28 The average height of 39 students is 164.5 cm. If the height of the teacher is also included, the average height of the class becomes 164.7cm. Find the height of the teacher.

- Ans
- ☒ 1. 172.5 cm
  - ☒ 2. 173 cm
  - ☒ 3. 173.5 cm
  - ☒ 4. 174 cm

Question ID : 630680143025

Status : Answered

Chosen Option : 2

Q.29 If  $\frac{1}{3.618} = 0.2763$ , find the value of  $\frac{1}{0.0003618}$ .

- Ans
- ☒ 1. 2673
  - ☒ 2. 2856
  - ☒ 3. 2763
  - ☒ 4. 1825

Question ID : 63068068407

Status : Answered

Chosen Option : 3

Q.30 Select the numbers from among the given options that can sequentially replace the question marks (?) in the following series.  
11, 38, 119, 362,?,?, 9839

- Ans ☒ 1. 1086, 3278
- ☒ 2. 1091, 3278
- ☒ 3. 1091, 3273
- ☒ 4. 1086, 3273

Question ID : 63068050872  
Status : Answered  
Chosen Option : 2

