NRL GET

Previous Year Paper
Mechanical 23 Sept 2021 (Shift 1)

NUMALIGARH REFINERY LIMITED

A GOVERNMENT OF INDIA ENTERPRISE

Participant ID	
Participant Name	
Test Center Name	
Test Date	23/09/2021
Test Time	9:00 AM - 10:30 AM
Subject	GET-Mechanical
Marks Obtained	

Section : **GET-Mechanical**

Q.1 **What is the total thermal resistance associated with this heat transfer process in double pipe heat exchanger with clean surfaces?**

(Symbols have their usual meaning)

Ans

✗ 1. $\sum R_{th} = \frac{\ln(d_o/d_i)}{2\pi Lk} + \frac{1}{h_o A_o}$

✗ 2. $\sum R_{th} = \frac{1}{h_i A_i} + \frac{1}{h_o A_o}$

✗ 3. $\sum R_{th} = \frac{1}{h_i A_i} + \frac{\ln(d_o/d_i)}{2\pi Lk}$

✓ 4. $\sum R_{th} = \frac{1}{h_i A_i} + \frac{\ln(d_o/d_i)}{2\pi Lk} + \frac{1}{h_o A_o}$

Question Type : **MCQ**
Question ID : **3089201046**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.2 **A 30 cm diameter pipe carries water under the head of 20 meter with velocity of 4 m/s. What is the flow rate in the pipe?**

Ans

✗ 1. $0.09\ m^3/s$

✓ 2. $0.09\ \pi\ m^3/s$

✗ 3. $0.9\ \pi\ m^3/s$

✗ 4. $9\ \pi\ m^3/s$

Question Type : **MCQ**
Question ID : **3089201042**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.3 **Oil of specific gravity 0.7 flow in a 1 m diameter tube. If the oil flow rate through the tube is 1200 litters/second. Find out the flow velocity of fluid in the tube.**

Ans

✔ 1. $4.8/\pi$ m/s

✘ 2. $2.8/\pi$ m/s

✘ 3. $4.8\ \pi$ m/s

✘ 4. $48/\pi$ m/s

Question Type : **MCQ**
Question ID : **3089201043**
Status : **Answered**
Chosen Option : **3**
Marks : **0**

Q.4 **An approach in which minimum work is done to reduce or eliminate inventories rather than optimize it is known as:**

Ans

✘ 1. Inventory optimization

✔ 2. Just- In Time production

✘ 3. Material requirement Planning

✘ 4. Two Bin Technique

Question Type : **MCQ**
Question ID : **3089201077**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.5 **The addition time in which non-critical activity can consume without increasing the project duration and known as:**

Where, EFT - Earliest finish Time, EFT - Earliest finish time, LFT - Latest finish Time, LST - Latest start time

Ans

✘ 1. Total Float = (LST - EST) or (LFT + EFT)

✔ 2. Total Float = (LST - EST) or (LFT - EFT)

✘ 3. Total Float = (LST + EST) or (LFT - EFT)

✘ 4. Total Float = (LST - EST) + (LFT - EFT)

Question Type : **MCQ**
Question ID : **3089201080**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.6 **For static and dynamic balancing of a single rotating mass by two masses rotating in different planes, the necessary conditions required are:**

Ans

✘ 1. Net dynamic force acting on the shaft must be equal to zero.

✔ 2. Net dynamic force as well as couple acting on the shaft during operations must be equal to zero.

✘ 3. Dynamic force as well as couple acting on the shaft may be kept minimum during operations if not equal to zero.

✘ 4. Net couple acting due to the dynamic forces on the shaft must be equal to zero.

Question Type : **MCQ**
Question ID : **3089201021**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.7 **When a shear strain induces in body of a volume V, due to this:**

Ans

✗ 1. area change occurs without change in volume

✗ 2. length change occurs without change in volume

✗ 3. volume change occurs along with angle

✓ 4. shape change occurs without change in volume

Question Type : **MCQ**
Question ID : **3089201012**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.8 **The process of improving the hardness of the outer layers only, leaving the core to retain their original softness is known as:**

Ans

✓ 1. Case Harding

✗ 2. Calcination

✗ 3. Quenching

✗ 4. Annealing

Question Type : **MCQ**
Question ID : **3089201062**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.9 **The (S-N) diagram provides information regarding:**

Ans

✗ 1. Stress versus strength of ductile materials of specimen

✗ 2. Stress versus strength of brittle material of specimen

✓ 3. Fatigue strength versus cycle life of specimen

✗ 4. Safety of factor versus actual load of specimen

Question Type : **MCQ**
Question ID : **3089201031**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.10 **A conical reducer forms a part of piping system and rest on a support; its diameter changes from 40 cm at inlet and 30 cm at exit. The water enters with a constant velocity of 9 m/s. What is the exit velocity of the water?**

Ans

✗ 1. 6 m/s

✗ 2. 9 m/s

✓ 3. 16 m/s

✗ 4. 4 m/s

Question Type : **MCQ**
Question ID : **3089201041**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.11 **A bar of 74 mm diameter is reduced to 70 mm by cutting tool while cutting orthogonally. If the mean length of the cut chip is 73 mm, what is the cutting ratio?**

Ans

✗ 1. = 0.709

✓ 2. = 0.32

✗ 3. = 1.23

✗ 4. = .0397

Question Type : **MCQ**
Question ID : **3089201068**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.12 **How the shear stress in the solid shaft specimen varies due to Torque T?**

Ans

✓ 1. Shear stress due to the torsion will be greatest on outer surfaces.

✗ 2. Shear stress due to the torsion will be zero on outer surfaces.

✗ 3. Shear stress due to the torsion will not have an impact on outer surfaces.

✗ 4. Shear stress due to the torsion will be smallest on outer surfaces.

Question Type : **MCQ**
Question ID : **3089201029**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.13 **The velocity of any point on the link with respect to another point on the same link is always:**

Ans

✗ 1. 45 degree to the line joining these points

✗ 2. random to the line joining these points

✗ 3. parallel to the line joining these points

✓ 4. perpendicular to the line joining these points

Question Type : **MCQ**
Question ID : **3089201014**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.14 **The ratio of change in length of a specimen to that of the original length of the specimen under testing is known as:**

Ans

✓ 1. Longitudinal strain

✗ 2. Factor of safety

✗ 3. Shear strain

✗ 4. Poisson's ratio

Question Type : **MCQ**
Question ID : **3089201008**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.15 A disk spinning with an angular velocity ω rad/s about an axis with mass moment of inertia I, the angular momentum of this disk during precession is correctly given by equation:

Ans
- ✗ 1. I / ω
- ✓ 2. I x ω
- ✗ 3. I + ω
- ✗ 4. I – ω

Question Type : **MCQ**
Question ID : **3089201016**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.16 The factor of safety defined as ratio of ultimate tensile stress (UTS) to the working stress is applicable for which type of material?

Ans
- ✗ 1. Composite materials
- ✗ 2. Ductile materials
- ✓ 3. Brittle materials
- ✗ 4. Plastic materials

Question Type : **MCQ**
Question ID : **3089201009**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.17 Which of the following material has highest young's modulus?

Ans
- ✗ 1. Graphite
- ✓ 2. Copper
- ✗ 3. Gold
- ✗ 4. Silver

Question Type : **MCQ**
Question ID : **3089201061**
Status : **Answered**
Chosen Option : **3**
Marks : **0**

Q.18 A network planning method in which activity time could not be estimated because of uncertainty of activity timing, this acquired the shape of probabilistic model is known as:

Ans
- ✓ 1. Programme evaluation review technique (PERT)
- ✗ 2. Least Cost scheduling (LCS)
- ✗ 3. Multi-operation Schedule system (MOSS)
- ✗ 4. Resource programming and scheduling method (RPSM)

Question Type : **MCQ**
Question ID : **3089201079**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.19 **The principle which states that the conditions of equilibrium of motion of a rigid body will remain unchanged if a force F acting at a given point of the rigid body is shifted to another point which is on same line of action is known as:**

Ans

✗ 1. Principle of Formability of vectors

✓ 2. Principle of transmiss bility

✗ 3. Principle of equivalent ability of resultant force

✗ 4. Principle of forcibility of unit vectors

Question Type : **MCQ**
Question ID : **3089201003**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.20 Let the standard size of the hole be $30^{+0.03}_{-0}$. Which one among the given values of shaft provides interference fit?

Ans

✗ 1. $30^{+0.04}_{-0}$

✓ 2. $30^{+0.08}_{+0.04}$

✗ 3. $30^{-0.02}_{-0.08}$

✗ 4. $30^{+0.03}_{-0}$

Question Type : **MCQ**
Question ID : **3089201069**
Status : **Answered**
Chosen Option : **1**
Marks : **0**

Q.21 **The function of the governor in engine is to regulate:**

Ans

✗ 1. the speed of the engine when there is variations in the fuel supply

✗ 2. the fuel supply when there is variations in the load and maximize the speed variations

✓ 3. the speed of the engine when there is variations in the load

✗ 4. the speed within the cycle and absorb the extra energy during power stroke

Question Type : **MCQ**
Question ID : **3089201018**
Status : **Answered**
Chosen Option : **2**
Marks : **0**

Q.22 The two helical springs with stiffness constant K_1 and K_2 are connected in series. What will be combined stiffness K of this assembly of the springs?

Ans

✗ 1. $K = \frac{1}{K_1} + \frac{1}{K_2}$

✗ 2. $\frac{1}{K} = K_1 + K_2$

✗ 3. $K = K_1 + K_2$

✓ 4. $K = \frac{K_1 K_2}{K_1 + K_2}$

Question Type : **MCQ**
Question ID : **3089201030**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.23 Herringbone gears are also known as:

Ans
- ✗ 1. Double spur gears
- ✓ 2. Double helical gears
- ✗ 3. Rack and Pinion
- ✗ 4. Double bevel gears

Question Type : **MCQ**
Question ID : **3089201015**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.24 A process in which volume kept constant is known as:

Ans
- ✓ 1. Isochoric Process
- ✗ 2. Reversible adiabatic process
- ✗ 3. Isobaric process
- ✗ 4. Isothermal process

Question Type : **MCQ**
Question ID : **3089201052**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.25 Considering a plane truss having M-number of members, N-number of joints, and R-number of reactions at its supports. Which of the following equation indicates that the truss is statically determinate in nature?

Ans
- ✓ 1. M + R = 2N
- ✗ 2. M + R = 3N
- ✗ 3. M + R > 3N
- ✗ 4. M + R > 2N

Question Type : **MCQ**
Question ID : **3089201006**
Status : **Answered**
Chosen Option : **2**
Marks : **0**

Q.26 A mass of 50 kg suspended from one end of a helical spring, the other end being fixed. The stiffness of the spring is 100 N/m. The resistance of air damping is given as 0.1 N/m/s vibrating freely at its natural frequency of 10 rad/s. What will be the magnification factor at resonance of the spring?

Ans
- ✗ 1. 1000
- ✗ 2. 500
- ✗ 3. 10
- ✓ 4. 100

Question Type : **MCQ**
Question ID : **3089201027**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.27 **According to the AWS specifications, the color code for thoriated Gas Tungsten Arc Welding electrode is:**

Ans

✔ 1. Red

✗ 2. Orange

✗ 3. Green

✗ 4. Brown

Question Type : **MCQ**
Question ID : **3089201065**
Status : **Answered**
Chosen Option : **2**
Marks : **0**

Q.28 **Pig iron is:**

Ans

✗ 1. iron with 0.40 carbon

✗ 2. iron with 2.40% carbon

✔ 3. iron with 4.0% carbon

✗ 4. pure iron with zero% carbon

Question Type : **MCQ**
Question ID : **3089201060**
Status : **Answered**
Chosen Option : **4**
Marks : **0**

Q.29 **Two forces are acting at a point with a magnitude and direction represented by the two adjacent sides of a parallelogram. Their resultant is represented by the diagonal of the parallelogram passing through that point. This is based on which law?**

Ans

✗ 1. Law of parallelogram of inertia

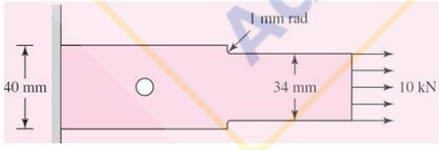
✔ 2. Law of parallelogram of forces

✗ 3. Law of triangle of inertia

✗ 4. Law of triangle of forces

Question Type : **MCQ**
Question ID : **3089201002**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.30 The 2-mm-thick bar shown in Fig.is loaded axially with a constant force of 10 kN at the 40-mm face of plate. When a 20-mm hole is drilled, what is the magnitude of stress concentrations near the hole?



Ans

✗ 1. 400 MPa

✗ 2. 100 MPa

✔ 3. 250 MPa

✗ 4. 1000 MPa

Question Type : **MCQ**
Question ID : **3089201034**
Status : **Answered**
Chosen Option : **2**
Marks : **0**

Q.31 For right-circular cylindrical shafts made up of different materials with an individual cylinder length L_i and torque T_i.
The angular deflection θ can be estimated accurately by equation:

Ans

✗ 1. $\theta = \sum \theta_i = \frac{T}{G} \sum \frac{L_i}{J_i}$

✓ 2. $\theta = \sum \theta_i = \sum \frac{T_i L_i}{G_i J_i}$

✗ 3. $\theta = \sum \theta_i = \sum \frac{T_i L_i}{G_l}$

✗ 4. $\theta = \sum \theta_i = \sum \frac{T_i}{G_l J_l}$

Question Type : **MCQ**
Question ID : **3089201032**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.32 **Which is the CORRECT equation for estimating of the tool life among the following, where T - tool life in minutes, V- cutting speed in m/min and C and n are constants?**

Ans

✗ 1. $VT^{3n} = C$

✓ 2. $VT^{n} = C$

✗ 3. $VT^{1/n} = C$

✗ 4. $V^{n}T = C$

Question Type : **MCQ**
Question ID : **3089201067**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.33 **The application for which a point to point numerical control system can be employed in a machine is a:**

Ans

✓ 1. Punching Machine

✗ 2. Lathe machine

✗ 3. Hobbling machine

✗ 4. Cutting machine

Question Type : **MCQ**
Question ID : **3089201072**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.34 Pascal is the unit of:

Ans

✗ 1. Pressure and it is N/in^2

✗ 2. Pressure and it is equal to N/m

✓ 3. Pressure and equal to N/m^2

✗ 4. Pressure and equal to N/mm^2

Question Type : **MCQ**
Question ID : **3089201035**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.35 Thermal stresses in an unconstrained body is represented by which equation accurately:

(the symbols have their usual meaning)

Ans

✗ 1. $\sigma_{th} = L\alpha\Delta t$

✗ 2. $\sigma_{th} = \alpha\Delta t$

✓ 3. $\sigma_{th} = 0$

✗ 4. $\sigma_{th} = E\alpha\Delta t$

Question Type : **MCQ**
Question ID : **3089201010**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.36 During testing in a UTM, the terms lower yield points and upper yield points are specifically mentioned in which type of material?

Ans

✓ 1. Ductile materials during tensile testing

✗ 2. Ductile materials during compression testing

✗ 3. Non-ferrous materials in tensile testing

✗ 4. Brittle materials in compression testing

Question Type : **MCQ**
Question ID : **3089201011**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.37 Due to partial balancing of the reciprocating parts there is a primary unbalanced force acts perpendicular to the line of stroke is known as:

Ans

✓ 1. Hammer blow

✗ 2. Swaying couple

✗ 3. Swaying blow force

✗ 4. Tractive force

Question Type : **MCQ**
Question ID : **3089201022**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.38 **When the Fourier's law of heat conduction is compared with one of the electric flow law, it is exactly similar to:**

Ans

✔ 1. the Ohm's law of current flow

✘ 2. the Faraday's law of conduction

✘ 3. the Plank's equation of heat flux

✘ 4. the Newton's law of cooling

Question Type : **MCQ**
Question ID : **3089201047**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.39 **Cutters with positive axial and radial rake angles are called:**

Ans

✘ 1. Positive shear-angle cutters

✘ 2. Negative cutters

✔ 3. Double positive cutters

✘ 4. Double-negative cutters

Question Type : **MCQ**
Question ID : **3089201066**
Status : **Answered**
Chosen Option : **1**
Marks : **0**

Q.40 **Which among the following technique use master schedule to manufacture the end product by preparing a detailed schedule of raw materials and components?**

Ans

✔ 1. Material Requirement Planning (MRP)

✘ 2. ABC analysis

✘ 3. Economic Order Quantity (EOQ)

✘ 4. Inventory model under risk

Question Type : **MCQ**
Question ID : **3089201075**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.41 Two fluid heat exchanger has inlet and outlet temperature of 65 °C and 40 °C for the hot fluid and 15 °C and 30 °C for the cold fluid. Find out whether it is counter flow or parallel flow and also calculate the effectiveness of heat exchanger.

Ans

✘ 1. Parallel flow with effectiveness $\varepsilon = 0.5$

✘ 2. Counter flow with effectiveness $\varepsilon = 0.4$

✘ 3. Counter flow with effectiveness $\varepsilon = 0.7$

✔ 4. Parallel flow with effectiveness $\varepsilon = 0.3$

Question Type : **MCQ**
Question ID : **3089201050**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.42 A solid conical bar of circular cross section is suspended vertically with a length L, and diameter of base is D what will be the elongation of the bar due to self-weight?

Consider specific gravity of the cone = γ, density ρ and E = Young's Modulus.

Ans

✗ 1. Total elongation $= \frac{\rho\gamma L}{6E}$

✗ 2. Total elongation $= \frac{\rho\gamma}{6E}$

✗ 3. Total elongation $= \frac{\rho\gamma L^2}{E}$

✓ 4. Total elongation $= \frac{\rho\gamma L^2}{6E}$

Question Type : **MCQ**
Question ID : **3089201013**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.43 **A piece of the metal having specific gravity 13.6 is placed in mercury of specific gravity 13.6, under this situation:**

Ans

✓ 1. the whole of the metal piece will be immersed with its top surface just at mercury level

✗ 2. the metal piece will sink to the bottom

✗ 3. the metal piece will be immersed in the mercury by half

✗ 4. the metal piece will float over the surface of mercury with no immersion

Question Type : **MCQ**
Question ID : **3089201038**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.44 **The laws of friction applicable as proposed by Coulomb are:**

Ans

✓ 1. Statics and kinetic friction

✗ 2. Belt and pulley friction

✗ 3. Rolling and sliding friction

✗ 4. Dry and fluid friction

Question Type : **MCQ**
Question ID : **3089201004**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.45 **To ensure the stability of a floating ship, which of the condition must be satisfied?**

Ans

✗ 1. The centre of gravity should be below the centre of buoyancy

✓ 2. The centre of gravity should be below the metacentre

✗ 3. The centre of gravity should be above the metacentre and buoyancy

✗ 4. The centre of gravity should be above the centre of buoyancy

Question Type : **MCQ**
Question ID : **3089201040**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.46 **Which among the following represent the correct formula for the economic order quantity in terms of annual usage of units, order quantity and the annual carrying cost?**

Ans

✔ 1. $EOQ = \sqrt{\frac{2(Annual\ Usage\ in\ units) \times (Order\ cost)}{(Annual\ carrying\ cost\ per\ unit)}}$

✘ 2. $EOQ = \sqrt{\frac{(Annual\ Usage\ in\ units) \times (Order\ cost)}{(Annual\ carrying\ cost\ per\ unit)}}$

✘ 3. $EOQ = \sqrt{\frac{2(Annual\ Usage\ in\ units)}{(Annual\ carrying\ cost\ per\ unit) \times (Order)}}$

✘ 4. $EOQ = \sqrt{\frac{(Annual\ Usage\ in\ units) \times (Order\ cost)}{2\ x(Annual\ carrying\ cost\ per\ unit)}}$

Question Type : **MCQ**
Question ID : **3089201076**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.47 **When the frequency of the vibrating system becomes equal to the natural frequency of the system, this type of vibration is known as:**

Ans

✔ 1. Resonance

✘ 2. Magnification factor

✘ 3. Forced v bration

✘ 4. Random vibration

Question Type : **MCQ**
Question ID : **3089201026**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.48 **Which among the following is NOT a metal forming process?**

Ans

✘ 1. Stamping

✔ 2. Welding

✘ 3. Drawing

✘ 4. Stretching

Question Type : **MCQ**
Question ID : **3089201064**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.49 **A cantilever shaft of 50 mm diameter and 400 mm long has a disc of mass 10 kg vibrating at its free end and has the stiffness of 160 N/m. Determine the natural frequency of transverse vibrations of this shaft.**

Ans

✗ 1. 56 Hz

✗ 2. 72 Hz

✓ 3. 84 Hz

✗ 4. 44 Hz

Question Type : **MCQ**
Question ID : **3089201024**
Status : **Answered**
Chosen Option : **1**
Marks : **0**

Q.50 **The work done per cycle in a two-stroke engine is accurately given by which of the following equations in terms of the number of strokes (n per cycle), power in watts (P) and the number of revolutions per minute (N)?**

Ans

✗ 1. $\text{Work done per cycle} = \frac{P \times 30}{n}$

✗ 2. $\text{Work done per cycle} = \frac{P \times n}{N}$

✓ 3. $\text{Work done per cycle} = \frac{P \times 60}{n}$

✗ 4. $\text{Work done per cycle} = \frac{P \times 30}{N}$

Question Type : **MCQ**
Question ID : **3089201019**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.51 Design of factor n_d is the ratio of:

Ans

✗ 1. $n_d = \frac{\text{maximum stress}}{\text{breaking } stress}$

✗ 2. $n_d = \frac{loss\ of\ function\ \text{stress}}{allowable\ stress}$

✓ 3. $n_d = \frac{loss\ of\ function\ strength}{allowable\ stress}$

✗ 4. $n_d = \frac{\text{ultimate breaking stress}}{allowablestress}$

Question Type : **MCQ**
Question ID : **3089201028**
Status : **Answered**
Chosen Option : **4**
Marks : **0**

Q.52 **The clearance space between a shaft and a concentric sleeve has been filled with a Newtonian fluid. The sleeve attains 30 cm/s when a force of 500 N is applied to it parallel to the shaft. What force is needed if it is desired to move the sleeve with a speed of 300 cm/s?**

Ans

✗ 1. 2000 N

✗ 2. 4000 N

✗ 3. 3000 N

✓ 4. 5000 N

Question Type : **MCQ**
Question ID : **3089201039**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.53 **Which of the following acts as reservoir of molten metal and supply it as required to overcome porosity because of shrinkage while solidification?**

Ans

✗ 1. Sprue

✗ 2. Runner

✓ 3. Riser

✗ 4. Pouring basin

Question Type : **MCQ**
Question ID : **3089201063**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.54 **Which among the following cam follower is extensively used in an aircraft engine?**

Ans

✗ 1. Spherical follower

✓ 2. Roller follower

✗ 3. Flat faced follower

✗ 4. Knife edge follower

Question Type : **MCQ**
Question ID : **3089201020**
Status : **Answered**
Chosen Option : **1**
Marks : **0**

Q.55 Calculate the normal component of acceleration when 8 m^3 /s of water passes over the bucket of a spillway of radius 4 m. Consider the thickness of sheet of water over the bucket as 0.5 m and take unit width.

Ans

✗ 1. $46\ m/s^2$

✗ 2. $16\ m/s^2$

✗ 3. $66\ m/s^2$

✓ 4. $64\ m/s^2$

Question Type : **MCQ**
Question ID : **3089201044**
Status : **Answered**
Chosen Option : **2**
Marks : **0**

Q.56 The correct relation between angle of static frictions (φs) and coefficient of static friction (μs) during impending motion of body can be stated as:

Ans

✗ 1. $\tan \emptyset_s / \mu_s$

✓ 2. $\tan \emptyset_s = \mu_s$

✗ 3. $\tan \emptyset_s - \mu_s$

✗ 4. $\tan \emptyset_s > \mu_s$

Question Type : **MCQ**
Question ID : **3089201005**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.57 **It is impossible to construct an engine which works in a complete cycle and produce no other effect except the work while exchanging heat with a single heat reservoir. This statement is known as:**

Ans

✗ 1. second law of thermodynamics given by Clausius about heat pump

✗ 2. second law of thermodynamics given by Clausius about heat engine

✓ 3. second law of thermodynamics given by Kelvin- Planck about heat engine

✗ 4. second law of thermodynamics given by Kelvin- Planck about heat pump

Question Type : **MCQ**
Question ID : **3089201055**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.58 **A gear set consists of a 20-tooth pinion driving a 40-tooth gear having the diametral pitch 2. Compute the center distance between the gears in mm.**

Ans

✗ 1. 40 mm

✗ 2. 20 mm

✗ 3. 10 mm

✓ 4. 15 mm

Question Type : **MCQ**
Question ID : **3089201033**
Status : **Answered**
Chosen Option : **1**
Marks : **0**

Q.59 The rotating shaft induces eccentricity e due to the weight. It is rotating with an angular speed ω and the critical speed of the shaft is ω_n . Which equation represents vertical displacement y CORRECTLY?

Ans

✗ 1. $y = \frac{\pi.\omega^2.e}{(\omega_n)^2 - \omega^2}$

✓ 2. $y = \frac{\omega^2.e}{(\omega_n)^2 - \omega^2}$

✗ 3. $y = \frac{\omega.e}{(\omega_n)^2 - \omega^2}$

✗ 4. $y = \frac{{\omega_n}^2.e}{(\omega^2)^2 - {\omega^2}_n}$

Question Type : **MCQ**
Question ID : **3089201025**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.60 **If two bodies A and B are in thermal equilibrium with each other and the body C is in contact with B, then as per:**

Ans

✗ 1. the Boyle's law body C is also in thermal equilibrium with A

✗ 2. the Charles's law body C is also in thermal equil brium with A

✓ 3. the Zeroth law body C is also in thermal equilibrium with A

✗ 4. the Joule's law body C is also in thermal equilibrium with B

Question Type : **MCQ**
Question ID : **3089201053**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.61 In a heat exchanger water flows through a long 2 cm diameter copper tube at bulk velocity of 2 m/s , the density of fluid is 1000 kg/ m^3 and the coefficient of viscosity μ= .010 kg/m sec. Find out the Reynold's number.

Ans

✓ 1. $R_e = 4000$

✗ 2. $R_e = 5000$

✗ 3. $R_e = 8000$

✗ 4. $R_e = 2000$

Question Type : **MCQ**
Question ID : **3089201048**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.62 **According to which concept "The propagation of thermal radiation takes place in the form of discrete quanta called photons and each quantum has an energy of E = hv"?**

Ans

✔ 1. Max Planck's Quantum Theory

✘ 2. Maxwell's Theory of Electromagnetic radiation

✘ 3. Wien's displacement law

✘ 4. Stefan-Boltzmann law

Question Type : **MCQ**
Question ID : **3089201049**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.63 A 0.5 kg of air with gas constant 0.287 kJ/kgK is initially at 1 bar with 160 °C temperatures compressed isothermally till the volume is reduced to 0.14 m^3 . Determine the initial volume of the gas.

Ans

✘ 1. $1.650\ m^3$

✔ 2. $0.613\ m^3$

✘ 3. $0.250\ m^3$

✘ 4. $0.650\ m^3$

Question Type : **MCQ**
Question ID : **3089201059**
Status : **Answered**
Chosen Option : **3**
Marks : **0**

Q.64 **A method of sale forecasting in which opinions from experts is solicit to arrive at reliable consensus is known as:**

Ans

✔ 1. Delphi method

✘ 2. Weighted moving average method

✘ 3. Trend Line method

✘ 4. Market Survey method

Question Type : **MCQ**
Question ID : **3089201073**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.65 **Which equation describes the relationship between the coefficient of heat pump, the coefficient of the refrigerator and the heat engine CORRECTLY?**

Ans

✘ 1. $(COP)_{HP} = (COP)_{Refrigerator} - 1$

✔ 2. $(COP)_{HP} = 1 + (COP)_{Refrigerator}$

✘ 3. $(COP)_{HP} - (COP)_{Refrigerator} = 0$

✘ 4. $(COP)_{HP} + 2 = (COP)_{Refrigerator}$

Question Type : **MCQ**
Question ID : **3089201056**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.66 **The intensity of pressure at point in a fluid at rest is:**

Ans

✗ 1. Equal in x and z but not equal in y direction

✗ 2. Equal in z direction but not equal in x and y directions.

✓ 3. Equal in all the directions

✗ 4. Unique in all the directions

Question Type : **MCQ**
Question ID : **3089201036**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.67 **Find the economic batch quantity for the given data: Annual requirement of parts 800, inventory cost 10% of value/year, the setup cost is Rs. 200 per setup and the cost per part Rs. 20.**

Ans

✗ 1. 800

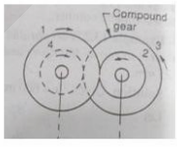
✗ 2. 200

✗ 3. 500

✓ 4. 400

Question Type : **MCQ**
Question ID : **3089201074**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.68 In the reverted gear train, four gears of radii r_1, r_2, r_3 and r_4 are arranged as shown in the following figure. Which of the following equations represent the centre distance (D) between the shafts accurately?



Ans

✗ 1. $D = r_1 + r_3 = r_2 + r_4$

✗ 2. $D = r_3 + r_2 = r_1 + r_4$

✓ 3. $D = r_1 + r_2 = r_3 + r_4$

✗ 4. $D = r_1 + r_4 = r_3 + r_2$

Question Type : **MCQ**
Question ID : **3089201017**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.69 **Which of the statement is CORRECT for critical thickness of insulation of pipes?**

Ans

✗ 1. If the addition of insulation increases the thickness of insulation for cylindrical pipes, the heat transfer increases.

✗ 2. If the inner radius of the bare pipe is less than the critical radius, as the outer radius decreases, the rate of heat transfer decreases first, attains minimum values and then starts increasing.

✓ 3. If the outer radius of the bare pipe is less than the critical radius, as the outer radius increases, the rate of heat transfer increases first, attains maximum value and then starts decreasing.

✗ 4. If the addition of insulation on pipes does not increase the face area of the surface, the heat transfer reduces.

Question Type : **MCQ**
Question ID : **3089201045**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.70 **A closed thermodynamic system is defined as:**

Ans

✗ 1. the system in which both mass and energy do not transfer to the surrounding

✓ 2. the system in which only energy can transfer to the surrounding but mass remains constant

✗ 3. the system in which both mass and energy can transfer to the surrounding

✗ 4. the system in which only mass can transfer to the surrounding but energy remains constant

Question Type : **MCQ**
Question ID : **3089201051**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.71 **A closed system of constant volume experience a temperature rise of 20 ℃ when certain process occurs. The heat transfer in the process is 25 kJ. The specific heat at constant volume for the pure gas is 2 KJ/kg ℃ and system contains 2 kg of this substance. Determine the work done during this process.**

Ans

✗ 1. 55 kJ

✗ 2. –75 kJ

✗ 3. 75 kJ

✓ 4. –55 kJ

Question Type : **MCQ**
Question ID : **3089201058**
Status : **Answered**
Chosen Option : **2**
Marks : **0**

Q.72 **The maximum temperature of fluid inlet in turbine is 650 ℃ and heat rejection temperature in the atmosphere is 40 ℃. Considering the Indian conditions, what will be the maximum efficiency of Carnot cycle?**

Ans

✗ 1. 60%

✗ 2. 55%

✗ 3. 45%

✓ 4. 66%

Question Type : **MCQ**
Question ID : **3089201057**
Status : **Answered**
Chosen Option : **2**
Marks : **0**

Q.73 **The study of a body in motion due to external forces which cause the motion are considered is known as:**

Ans

✗ 1. Kinematics

✗ 2. Statics

✓ 3. Kinetics

✗ 4. Dynamics

Question Type : **MCQ**
Question ID : **3089201001**
Status : **Answered**
Chosen Option : **4**
Marks : **0**

Q.74 **The stresses developed on a perpendicular plane area of a body due to external force is known as:**

Ans

✗ 1. Point stress

✗ 2. Shear stress

✓ 3. Normal stress

✗ 4. Plane stress

Question Type : **MCQ**
Question ID : **3089201007**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.75 **A technique used for planning and controlling the most logical and economic sequence of operations for accomplishing a project is known as:**

Ans

✓ 1. Critical path method

✗ 2. Optimizing the cost

✗ 3. Updating the network

✗ 4. Smoothing

Question Type : **MCQ**
Question ID : **3089201078**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.76 Which of equation represents the correct relation between absolute pressure P_{abs} , atmospheric pressure P_{atm} , the gauge pressure P_g vacuum pressure P_{vac} ?

Ans

✗ 1. $P_g = P_{atm} + P_{abs} + P_{vac}$

✗ 2. $P_{abs} = P_g + P_{vac}$

✗ 3. $P_{abs} = P_{atm} + P_g - P_{vac}$

✓ 4. $P_{abs} = P_{atm} + P_g$

Question Type : **MCQ**
Question ID : **3089201037**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.77 **The value of tolerance unit i is identified by which equation accurately though tolerance grade?**

Ans

✗ 1. $i = 0.90 \times \sqrt[3]{D} + 0.001 \times D$

✓ 2. $i = 0.45 \times \sqrt[3]{D} + 0.001 \times D$

✗ 3. $i = 0.45 \times \sqrt[3]{D} + 0.1 \times D$

✗ 4. $i = 0.45 \times \sqrt[3]{D} + 0.001$

Question Type : **MCQ**
Question ID : **3089201070**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.78 **What is the purpose of G00 in a computer integrated manufacturing machine?**

Ans

✗ 1. Hold/delay

✗ 2. Dwell

✗ 3. Deceleration of feed rate

✓ 4. Point-to point positioning and for rapid traverse

Question Type : **MCQ**
Question ID : **3089201071**
Status : **Answered**
Chosen Option : **1**
Marks : **0**

Q.79 **When no external force acts on a body after giving it initial displacement, the vibration of the body under this conditions is known as:**

Ans

✗ 1. Periodic force vibration

✓ 2. Free vibration

✗ 3. Random vibration

✗ 4. Forced v bration

Question Type : **MCQ**
Question ID : **3089201023**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.80 **An air is passed through nozzle adiabatically to expand from an initial pressure of 3 bars and temperature of 150 °C to a final pressure of 1.0 bar at 30. What is work done by nozzle?**

Ans

✗ 1. 488 kJ

✗ 2. –188 kJ

✗ 3. 266 kJ

✓ 4. Flow in nozzle is adiabatic and produce no work

Question Type : **MCQ**
Question ID : **3089201054**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Section : **General Knowledge and Current Affairs**

Q.1 Who has written 'Akbar-Nama'?

Ans
- ✔ 1. Abu'l-Fazl bn Mubarak
- ✘ 2. Babur
- ✘ 3. Tolstoy
- ✘ 4. Kalidas

Question Type : **MCQ**
Question ID : **3089201087**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.2 Who has written the 'Pride and Prejudice'?

Ans
- ✔ 1. Jane Austen
- ✘ 2. H.G.Wells
- ✘ 3. Thomas Hardy
- ✘ 4. Sir Thomas Moor

Question Type : **MCQ**
Question ID : **3089201086**
Status : **Answered**
Chosen Option : **3**
Marks : **0**

Q.3 HRIDAY stands for:

Ans
- ✘ 1. National Heritage Corporate Development and Augmentation Yojana
- ✘ 2. National Housing City Development and Augmentation Yojana
- ✔ 3. National Heritage City Development and Augmentation Yojana
- ✘ 4. Heritage City Development and Augmentation Yojana

Question Type : **MCQ**
Question ID : **3089201082**
Status : **Answered**
Chosen Option : **4**
Marks : **0**

Q.4 The first of the 10 Sikh Gurus, Guru Nanak was born in _____ at Talwandi, near Lahore.

Ans
- ✘ 1. 1359
- ✔ 2. 1469
- ✘ 3. 1595
- ✘ 4. 1672

Question Type : **MCQ**
Question ID : **3089201081**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.5 **Alexander challenged king Porus, ruler of the kingdom between the rivers Jhelum and _____.**

Ans
✔ 1. Chenab
✘ 2. Tapti
✘ 3. Ganga
✘ 4. Ravi

Question Type : **MCQ**
Question ID : **3089201085**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.6 **On exposure to air, table salt (NaCl) turns moist and ultimately forms a solution especially during rainy season because it contains impurities like _____ which are deliquescent.**

Ans
✘ 1. sodium sulphate
✘ 2. ferrous chloride
✘ 3. copper sulphate
✔ 4. calcium chloride

Question Type : **MCQ**
Question ID : **3089201083**
Status : **Answered**
Chosen Option : **1**
Marks : **0**

Q.7 **The Chambal is a major tributary of which of the following rivers?**

Ans
✔ 1. Yamuna
✘ 2. Godavari
✘ 3. Ganges
✘ 4. Brahmaputra

Question Type : **MCQ**
Question ID : **3089201084**
Status : **Answered**
Chosen Option : **3**
Marks : **0**

Section : **English**

Q.1 **The sentence below has been divided into three parts. Select the part of the sentence that has an error. If the sentence has no error, select the option 'No Error'.**

He dedicates every hour of his / waking life into playing the best tennis he / can, and what is his reward? / No Error

Ans
✘ 1. can, and what is his reward?
✔ 2. waking life into playing the best tennis he
✘ 3. No Error
✘ 4. He dedicates every hour of his

Question Type : **MCQ**
Question ID : **3089201091**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.2 **The question below consist of a set of labelled sentences. Out of four options given, select the most logical order of the sentences which form a paragraph.**

The polar bear is a hypercarnivores bear whose native range lies largely within the Arctic Circle.

P. Its body characteristics are adapted for cold temperatures, for moving across snow, ice and open water, and for hunting seals, which make up most of its diet.
Q. A boar (adult male) weighs around 350–700 kg, while a sow (adult female) is about half that size.
R. It is the largest extant bear species, as well as the largest extant land carnivore.
S. Although it is the sister species of the brown bear, it has evolved to occupy a narrower ecological niche.

Although most polar bears are born on land, they spend most of their time on the sea ice.

Ans
✗ 1. PSRQ
✗ 2. QRPS
✗ 3. SPRQ
✓ 4. RQSP

Question Type : **MCQ**
Question ID : **3089201094**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.3 **Four words are given, out of which only one word is spelt correctly. Choose the CORRECTLY spelt word.**

Ans
✓ 1. GALLOP
✗ 2. GALLOPP
✗ 3. GALOP
✗ 4. GALLOPE

Question Type : **MCQ**
Question ID : **3089201088**
Status : **Answered**
Chosen Option : **4**
Marks : **0**

Q.4 **Select the word segment that substitutes (replaces) the bracketed word segment correctly and completes the sentence meaningfully. Select the option 'no correction required' if the sentence is correct as given.**

Gordon (walk out into the hall) and took his long leather coat from the rail.

Ans
✗ 1. walks out in to the hall
✓ 2. wa ked out into the hall
✗ 3. walked out in to the hall
✗ 4. No correction required.

Question Type : **MCQ**
Question ID : **3089201092**
Status : **Answered**
Chosen Option : **2**
Marks : **1**

Q.5 **Select the most appropriate 'one word ' for the expressions given below.**

The symbols of royalty.

Ans

✗ 1. Insignia

✗ 2. Coat of Arms

✗ 3. Monarch

✓ 4. Regalia

Question Type : **MCQ**
Question ID : **3089201090**
Status : **Answered**
Chosen Option : **3**
Marks : **0**

Q.6 **Fill in the blank with the most appropriate choice.**

An unreasonable fear of flying and a general _____ of machines make some people hesitate to take a flight.

Ans

✗ 1. disbelief

✗ 2. veracity

✓ 3. mistrust

✗ 4. principle

Question Type : **MCQ**
Question ID : **3089201093**
Status : **Answered**
Chosen Option : **1**
Marks : **0**

Q.7 **Select the most appropriate meaning of the given idiom.**

When hell freezes over.

Ans

✓ 1. Something that will never happen

✗ 2. Being caught red handed

✗ 3. Bad timing

✗ 4. When things are worst

Question Type : **MCQ**
Question ID : **3089201089**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Section : **Reasoning & Numerical Ability**

Q.1 **Select the option that is related to the third term on the same basis as the second term is related to the first term.**

Heptagon :: 7 :: Nonagon : ?

Ans

✓ 1. 9

✗ 2. 8

✗ 3. 11

✗ 4. 10

Question Type : **MCQ**
Question ID : **3089201099**
Status : **Answered**
Chosen Option : **1**
Marks : **1**

Q.2 **Find the missing term in the following number series.**

333, 342, 339, 348, _____

Ans

✗ 1. 347

✗ 2. 352

✗ 3. 356

✓ 4. 345

Question Type : **MCQ**
Question ID : **3089201097**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.3 **In a certain code language, if 4 is called 5, 5 is called 3, 3 is called 1, 1 is called 2, and 2 is called 7, then which is the smallest prime number?**

Ans

✗ 1. 1

✗ 2. 3

✓ 3. 7

✗ 4. 2

Question Type : **MCQ**
Question ID : **3089201100**
Status : **Answered**
Chosen Option : **3**
Marks : **1**

Q.4 **The average of the cube of the first four natural numbers is:**

Ans

✗ 1. 100

✗ 2. 50

✗ 3. 75

✓ 4. 25

Question Type : **MCQ**
Question ID : **3089201096**
Status : **Answered**
Chosen Option : **4**
Marks : **1**

Q.5 **Find the missing term in the following letter series.**

_____, GD, EB, CZ, AX

Ans

✓ 1. IF

✗ 2. HE

✗ 3. BF

✗ 4. IK

Question Type : **MCQ**
Question ID : **3089201095**
Status : **Answered**
Chosen Option : **4**
Marks : **0**

Q.6 **Out of the given options, three are similar in a certain manner. However, one option is NOT like the other three. Select the option which is different from the rest.**

Ans

✗ 1. H8S

✗ 2. D4W

✗ 3. L12O

✓ 4. J10P

Question Type : **MCQ**
Question ID : **3089201098**
Status : **Answered**
Chosen Option : **4**
Marks : **1**