Delhi Development Authority
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Participant ID	
Participant Name	
Test Center Name	iON Digital Zone iDZ 2 Sector 62
Test Date	03/04/2023
Test Time	9:00 AM - 11:00 AM
Subject	Junior Engineer (Electrical or Mechanical)

Section : **Domain Questions (Electrical)**

Q.1 A resistor absorbs an instantaneous power of $(20 \cos^2 t)$ mW when connected to a voltage source of v = 10 cos t volts. Find the value of the resistor.

Ans
✗ 1. 500 Ω
✓ 2. 5 kΩ
✗ 3. 50 Ω
✗ 4. 50 kΩ

Question ID : **630680197816**
Status : **Answered**
Chosen Option : **2**

Q.2 In a three-phase alternator, if the short pitch angle is 'α' degrees (electrical) for the fundamental flux wave, then pitch factor for 3rd harmonic will be:

Ans
✗ 1. Cos α/3
✗ 2. Cos α/2
✗ 3. 3*Cos α/2
✓ 4. Cos 3α/2

Question ID : **630680197848**
Status : **Answered**
Chosen Option : **4**

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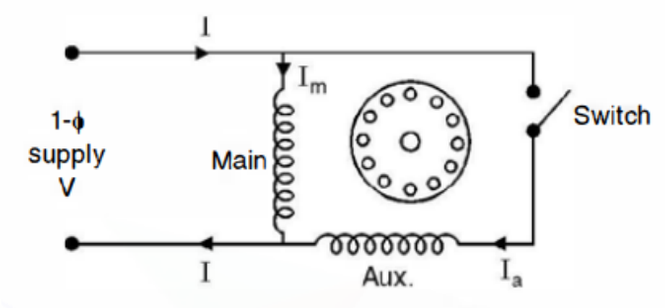
Q.3 Identify the one-phase induction motor in the given schematic diagram.



Ans
1. Capacitor-start induction motor
2. Capacitor-start capacitor-run motor
3. Permanent split capacitor motor
4. Split phase induction motor

Question ID : **630680197845**
Status : **Answered**
Chosen Option : **4**

Q.4 Which condition is always correct for any transmission line?

Ans
1. $AD - BC = 1$
2. $AB - CD = 1$
3. $AB - CD = 0$
4. $AC - BD = 1$

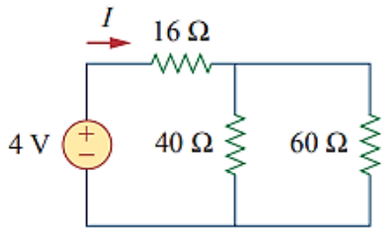
Question ID : **630680197834**
Status : **Answered**
Chosen Option : **1**

Q.5 For PMMC type instrument, which of the following features is INCORRECT?

Ans
1. Scale is uniform
2. Low power consumption
3. Can be used for only DC
4. Torque to weight ratio is very low

Question ID : **630680197832**
Status : **Answered**
Chosen Option : **4**

Q.6 Find current 'I' in the given circuit.



Ans
1. 0.1 A
2. 0.25 A
3. 0.5 A
4. 0.05 A

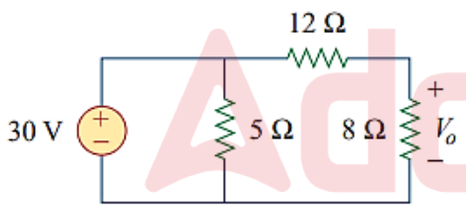
Question ID : **630680197822**
Status : **Answered**
Chosen Option : **1**

Q.7 Overhead distribution system is better than underground distribution system only in terms of _____.

Ans
1. possibility of fault occurrence
2. public safety
3. appearance
4. initial cost

Question ID : **630680197840**
Status : **Answered**
Chosen Option : **4**

Q.8 Find the voltage V_o in given circuit.



Ans
1. 24 V
2. 30 V
3. 18 V
4. 12 V

Question ID : **630680197823**
Status : **Answered**
Chosen Option : **4**

Q.9 With reference to transmission efficiency of a transmission line, state whether the given statements are true or false.

Statements:

1. Load current is inversely proportional to the load p.f.
2. Transmission efficiency of a line decreases with decrease in load p.f.

Ans
✔ 1. Statement 1 and 2 are both true
✘ 2. Statement 1 is false, but statement 2 is true
✘ 3. Statement 1 is true, but statement 2 is false
✘ 4. Statement 1 and 2 are both false

Question ID : **630680197837**
Status : **Answered**
Chosen Option : **1**

Q.10 For a 66 kV transmission line, how many discs are required in suspension type insulator?

Ans
✘ 1. 8
✘ 2. 2
✔ 3. 6
✘ 4. 4

Question ID : **630680197838**
Status : **Answered**
Chosen Option : **4**

Q.11 Find the energy stored in the inductor of 5 H if it carries a current of 4 A.

Ans
✔ 1. 40 J
✘ 2. 20 J
✘ 3. 80 J
✘ 4. 10 J

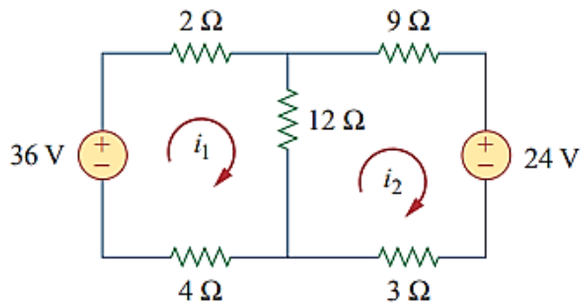
Question ID : **630680197827**
Status : **Answered**
Chosen Option : **1**

Q.12 In synchronous motor the air gap flux is due to:

Ans
✘ 1. rotor current only
✘ 2. stator current only
✘ 3. load only
✔ 4. stator current and rotor current both

Question ID : **630680197849**
Status : **Answered**
Chosen Option : **4**

Q.13 Find the current i_1 in the given circuit.



Ans
1. 1 A
2. 4 A
3. 2 A
4. 3 A

Question ID : **630680197824**
Status : **Answered**
Chosen Option : **3**

Q.14 With reference to corona effect, which of the following options is INCORRECT?

Ans
1. No power loss
2. Radio interference
3. Production of ozone
4. Hissing sound

Question ID : **630680197839**
Status : **Answered**
Chosen Option : **1**

Q.15 A three-phase induction motor has a supply frequency of 60 Hz and synchronous speed of 1800 rpm. Find the number of poles.

Ans
1. 8
2. 4
3. 6
4. 2

Question ID : **630680197843**
Status : **Answered**
Chosen Option : **2**

Q.16 Among the generalised circuit constants of transmission line, constant B is expressed in _____.

Ans
1. Siemens
2. Volts
3. Ohms
4. Amperes

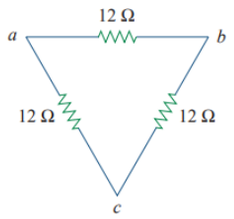
Question ID : **630680197833**
Status : **Answered**
Chosen Option : **3**

Q.17 In a series RL circuit, the true power is equal to half the apparent power. Find the phase angle.

Ans
1. ✗ $90°$
2. ✗ $30°$
3. ✓ $60°$
4. ✗ $45°$

Question ID : **630680197830**
Status : **Answered**
Chosen Option : **3**

Q.18 What will be the value of each resistor if delta to star transformation is performed for following circuit?



Ans
1. ✗ $24\ \Omega$
2. ✗ $36\ \Omega$
3. ✗ $12\ \Omega$
4. ✓ $4\ \Omega$

Question ID : **630680197819**
Status : **Answered**
Chosen Option : **4**

Q.19 Arrange the given materials in descending order according to their resistivity.

Silver, Mica, Silicon

Ans
1. ✗ Silicon, Mica, Silver
2. ✗ Silver, Silicon, Mica
3. ✓ Mica, Silicon, Silver
4. ✗ Mica, Silver, Silicon

Question ID : **630680197817**
Status : **Answered**
Chosen Option : **3**

Q.20 The total inductance of two coils coupled in series aiding connection (cumulatively coupled) is 120 mH. If the same coils are connected differentially, then the total inductance is 20 mH. Find the mutual inductance.

Ans
1. ✗ 20 mH
2. ✗ 35 mH
3. ✓ 25 mH
4. ✗ 40 mH

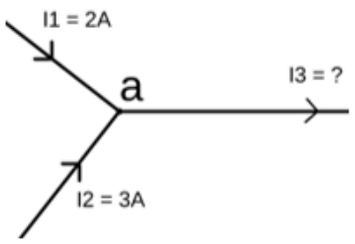
Question ID : **630680197826**
Status : **Answered**
Chosen Option : **3**

Q.21 Internal characteristic of DC generator is a plot between the _____ and _____.

Ans
✗ 1. field current, load current
✗ 2. field current, terminal voltage
✓ 3. generated voltage, load current
✗ 4. terminal voltage, load current

Question ID : **630680197853**
Status : **Answered**
Chosen Option : **2**

Q.22 Find the current I3 in the given network.



Ans
✗ 1. 1 A
✗ 2. 3 A
✓ 3. 5 A
✗ 4. 2.5 A

Question ID : **630680197820**
Status : **Answered**
Chosen Option : **3**

Q.23 An electric iron draws 3 A at 210 V. Find its resistance.

Ans
✗ 1. 90 Ω
✓ 2. 70 Ω
✗ 3. 80 Ω
✗ 4. 60 Ω

Question ID : **630680197814**
Status : **Answered**
Chosen Option : **2**

Q.24 Find the Q-factor of an RLC series circuit that will resonate at 4.5 kHz and has a bandwidth of 150 Hz.

Ans
✗ 1. 45
✗ 2. 15
✗ 3. 60
✓ 4. 30

Question ID : **630680197831**
Status : **Answered**
Chosen Option : **4**

Q.25 In a transmission line, the receiving end power is 200 kW. If the transmission efficiency is 80%, calculate the sending end power.

Ans
1. ✗ 160 kW
2. ✗ 225 kW
3. ✗ 200 kW
4. ✓ 250 kW

Question ID : **630680197836**
Status : **Answered**
Chosen Option : **4**

Q.26 Which of the following is an INCORRECT way of energy conservation in electric motors?

Ans
1. ✓ Reducing power factor
2. ✗ Improving power supply quality
3. ✗ Optimum loading
4. ✗ Using soft starter

Question ID : **630680197842**
Status : **Answered**
Chosen Option : **1**

Q.27 With reference to AC distribution, state whether the given statement are true or false.

Statements:
1. In AC system, the voltage drop is due to resistance only.
2. In AC system, the additions or subtractions of currents are done vectorially.

Ans
1. ✓ Statement 1 is false, but statement 2 is true
2. ✗ Statement 1 is true, but statement 2 is false
3. ✗ Statement 1 and 2 are both true
4. ✗ Statement 1 and 2 both are false

Question ID : **630680197841**
Status : **Answered**
Chosen Option : **1**

Q.28 Which method is used to prevent flashover in DC machines?

Ans
1. ✗ Brush shifting
2. ✗ Resistance commutation
3. ✗ Commutating poles
4. ✓ Compensating windings

Question ID : **630680197852**
Status : **Answered**
Chosen Option : **2**

Q.29 A sinusoidal current is expressed as $i(t) = 200 \sin 200\pi t$. The frequency of the signal is _____.

Ans
✔ 1. 100 Hz
✗ 2. 25 Hz
✗ 3. 200 Hz
✗ 4. 50 Hz

Question ID : **630680197828**
Status : **Answered**
Chosen Option : **1**

Q.30 With reference to comparison of synchronous motor and induction motor, state whether the given statements are true or false.

Statements:
1. Both motors are doubly excited machines.
2. For same rating and same output, induction motor is more efficient than synchronous motor.

Ans
✔ 1. Statement 1 and 2 are both false
✗ 2. Statement 1 is true, but statement 2 is false
✗ 3. Statement 1 is false, but statement 2 is true
✗ 4. Statement 1 and 2 are both true

Question ID : **630680197850**
Status : **Answered**
Chosen Option : **1**

Q.31 For which of the following conditions does an induction machine act as a generator?

Ans
✔ 1. Slip is negative
✗ 2. Slip is positive and less than 1
✗ 3. Slip is zero
✗ 4. Slip is positive and greater than 1

Question ID : **630680197844**
Status : **Answered**
Chosen Option : **1**

Q.32 In split phase induction motor, the starting torque is _____ of the full load torque.

Ans
✗ 1. 100 to 125%
✗ 2. 50 to 75%
✔ 3. 150 to 200%
✗ 4. 25 to 50%

Question ID : **630680197846**
Status : **Answered**
Chosen Option : **1**

Q.33 With reference to underground cables, super tension cables are manufactured for operation in _____ range.

Ans

✗ 1. 33 kV to 66 kV

✗ 2. 66 kV to 132 kV

✗ 3. 11 kV to 22 kV

✓ 4. 22 kV to 33 kV

Question ID : **630680197835**
Status : **Answered**
Chosen Option : **1**

Q.34 Find the average value of a full wave rectified alternation current having peak value of 100 A.

Ans

✗ 1. 6.37 A

✗ 2. 7.07 A

✗ 3. 70.7 A

✓ 4. 63.7 A

Question ID : **630680197829**
Status : **Answered**
Chosen Option : **4**

Q.35 Which parameter in a magnetic circuit is analogous to conductance in an electric circuit?

Ans

✗ 1. Reluctance

✗ 2. mmf

✗ 3. Flux

✓ 4. Permeance

Question ID : **630680197825**
Status : **Answered**
Chosen Option : **4**

Q.36 For producing 60 Hz frequency, a 24-pole alternator must run at _____.

Ans

✗ 1. 600 rpm

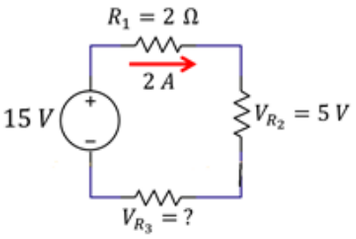
✗ 2. 1500 rpm

✓ 3. 300 rpm

✗ 4. 3000 rpm

Question ID : **630680197847**
Status : **Answered**
Chosen Option : **3**

Q.37 Find the voltage V_{R3} in the given circuit.



Ans
1. 6 V
2. 10 V
3. 4 V
4. 9 V

Question ID : **630680197821**
Status : **Answered**
Chosen Option : **1**

Q.38 A 4-pole wave wound armature has 360 conductors and is rotated at 500 rpm. If the useful flux is 40 mWb, calculate the generated emf.

Ans
1. 480 V
2. 240 V
3. 120 V
4. 960 V

Question ID : **630680197851**
Status : **Answered**
Chosen Option : **2**

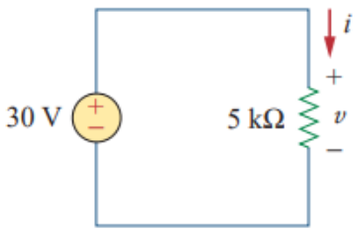
Q.39 Determine the resistance of a 1 km-long metal strip having rectangular cross-section of 2.5 cm × 0.05 cm.

(Assume resistivity = 1.25×10^{-8} Ω.m.)

Ans
1. 1 Ω
2. 10 Ω
3. 0.1 Ω
4. 100 Ω

Question ID : **630680197818**
Status : **Answered**
Chosen Option : **1**

Q.40 Find the value of the current 'I' in the given circuit.



Ans
1. 0.6 A
2. 6 A
3. 0.06 A
4. 0.006 A

Question ID : **630680197815**
Status : **Answered**
Chosen Option : **4**

Section : **Domain Questions (Mechanical)**

Q.1 The energy grade line (EGL) shows the height of _____.

Ans
1. datum head
2. velocity head
3. pressure head
4. total Bernoulli head

Question ID : **630680197860**
Status : **Answered**
Chosen Option : **4**

Q.2 The defect in casting, in which a large, well-rounded cavity is produced by the gases which displace the molten metal at the cope surface of a casting is known as:

Ans
1. gas holes
2. blow
3. blister
4. porosity

Question ID : **630680197872**
Status : **Answered**
Chosen Option : **3**

Q.3 _____ is the ratio of equivalent lengths of a column fixed at one end with other free to one with both ends hinged (consider length of two columns to be same).

Ans
1. 1 : 2
2. 2 : 1
3. 1 : 1
4. 3 : 1

Question ID : **630680197884**
Status : **Not Answered**
Chosen Option : **--**

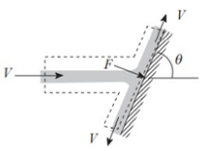
Q.4 _____ is the relationship between Modulus of resilience (R), Young's Modulus of rigidity (E) and stress induced in the body (σ).

Ans

1. $R = \frac{3\sigma^2}{E}$
2. $R = \frac{\sigma^2}{2E}$
3. $R = \frac{2\sigma^2}{E}$
4. $R = \frac{\sigma^2}{3E}$

Question ID : **630680197880**
Status : **Answered**
Chosen Option : **2**

Q.5 With reference to the given figure, jet striking a fixed flat inclined plate at an angle **θ**, the force **F**, exerted normal to the plate surface by the jet is (V is velocity of jet, A is area of plate and ρ is fluid density):



Ans

1. $F = \frac{\rho AV^2}{\cos\theta}$
2. $F = \rho AV^2 \sin\theta$
3. $F = \frac{\rho AV^2}{\sin\theta}$
4. $F = \rho AV^2 \cos\theta$

Question ID : **630680197858**
Status : **Not Answered**
Chosen Option : **--**

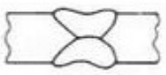
Q.6 The ratio of the cylinder volumes after and before the combustion process in a compression ignition engine is known as:

Ans

1. compression ratio
2. air-fuel ratio
3. cut-off ratio
4. volumetric efficiency

Question ID : **630680197864**
Status : **Answered**
Chosen Option : **1**

Q.7 Of the welding defects in the given options, which figure represents Overlap?

Ans
✗ 1. 
✓ 2. 
✗ 3. 
✗ 4. 

Question ID : **630680197875**
Status : **Answered**
Chosen Option : **3**

Q.8 _____ equation is based on conservation of mass principle.

Ans
✓ 1. Continuity
✗ 2. Hagen–Poiseuille
✗ 3. Navier-Stokes
✗ 4. Perfect gas

Question ID : **630680197855**
Status : **Answered**
Chosen Option : **1**

Q.9 Flow through pipes is also known as _____.

Ans
✓ 1. pressure driven flow
✗ 2. uniform flow
✗ 3. velocity driven flow
✗ 4. laminar flow

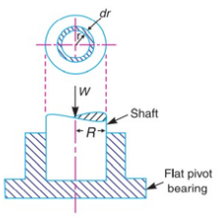
Question ID : **630680197856**
Status : **Answered**
Chosen Option : **1**

Q.10 Transition from laminar to turbulent flow, in a smooth circular pipe, occurs at a Reynolds number of _____.

Ans
✗ 1. 900
✗ 2. 1200
✓ 3. 2100
✗ 4. 3200

Question ID : **630680197854**
Status : **Answered**
Chosen Option : **3**

Q.11 When the pressure is uniformly distributed over the Flat Pivot Bearing area, as shown in the figure, the total frictional torque developed is (W is the load transmitted over the bearing area, R is the radius of bearing surface, μ is the coefficient of friction) _____.



Ans

✗ 1. μWR

✗ 2. $\frac{3}{2}\mu WR$

✓ 3. $\frac{2}{3}\mu WR$

✗ 4. $\frac{1}{2}\mu WR$

Question ID : **630680197889**
Status : **Not Answered**
Chosen Option : **--**

Q.12 Which of the following is NOT a desirable property of raw material used in metal-casting process?

Ans

✗ 1. Plasticity

✗ 2. Ductility

✓ 3. Brittleness

✗ 4. High fluidity when melted

Question ID : **630680197870**
Status : **Answered**
Chosen Option : **3**

Q.13 _____ is an example of the second inversion of a single slider crank chain mechanism.

Ans

✗ 1. Scotch yoke

✓ 2. Whitworth Quick-Return mechanism

✗ 3. Oldham's coupling

✗ 4. Reciprocating engine

Question ID : **630680197887**
Status : **Not Answered**
Chosen Option : **--**

Q.14 In a typical sensitive drilling machine, the _____ provides feed to the drill by means of a rack and pinion on the quill.

Ans

✗ 1. motor

✗ 2. pillar

✓ 3. handwheel

✗ 4. spindle

Question ID : **630680197877**
Status : **Answered**
Chosen Option : **1**

Q.15 In the context of combustion in SI engines, the mixture in which Stoichiometric fuel-air ratio is more than actual fuel-air ratio is known as:

Ans

✗ 1. complete mixture

✗ 2. rich mixture

✗ 3. ideal mixture

✓ 4. lean mixture

Question ID : **630680197865**
Status : **Answered**
Chosen Option : **2**

Q.16 The ratio of power developed by the runner to power available at turbine inlet is known as the _____ efficiency of a turbine.

Ans

✗ 1. mechanical

✗ 2. generator

✓ 3. hydraulic

✗ 4. volumetric

Question ID : **630680197859**
Status : **Answered**
Chosen Option : **1**

Q.17 The point at which shear stress in a hollow shaft subjected to a torsional moment is maximum, is located at the _____.

Ans

✓ 1. outer surface of the shaft

✗ 2. centre of the shaft

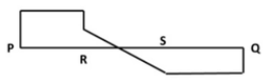
✗ 3. middle of thickness

✗ 4. inner surface of the shaft

Question ID : **630680197885**
Status : **Answered**
Chosen Option : **1**

Q.18 Read the following statements and select the correct answer.

The shear force diagram of a simply supported beam is shown in the figure. The beam is supported at P and Q.



Statement A: There is a concentrated load at R.

Statement B: There is a uniformly distributed load in between P and R, and S and Q.

Ans

✗ 1. Both statement A and statement B are incorrect.

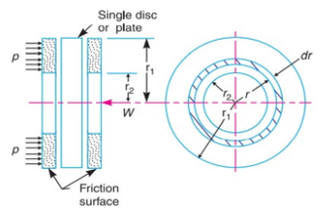
✓ 2. Statement A is correct, but statement B is incorrect.

✗ 3. Both statement A and statement B are correct.

✗ 4. Statement A is incorrect, but statement B is correct.

Question ID : **630680197882**
Status : **Answered**
Chosen Option : **1**

Q.19 When the wear is uniform over the Plate Clutch as shown in the figure, the total frictional torque developed is (W is the axial thrust, $R = \left[\frac{r_1 + r_2}{2}\right]$, μ is the coefficient of friction) _____.



Ans

✗ 1. $\frac{2}{3}\mu WR$

✗ 2. $\frac{1}{2}\mu WR$

✓ 3. μWR

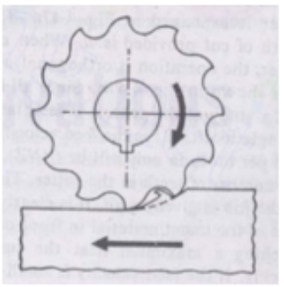
✗ 4. $\frac{3}{2}\mu WR$

Question ID : **630680197890**
Status : **Not Answered**
Chosen Option : **--**

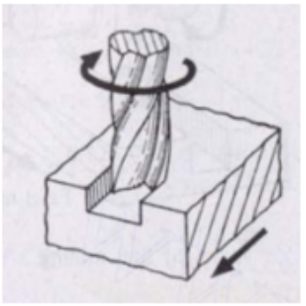
Q.20 Which of the machining operations shown in the following figures represents face milling operation?

Ans

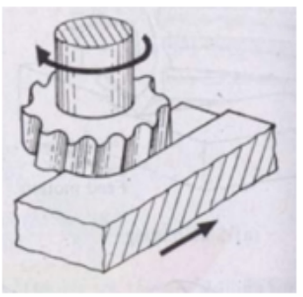
✗ 1.



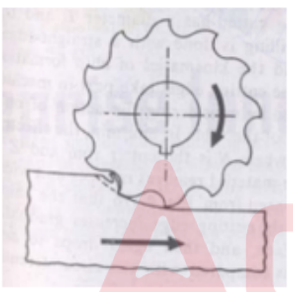
✗ 2.



✓ 3.



✗ 4.



Question ID : **630680197876**
Status : **Not Answered**
Chosen Option : **--**

Q.21 Identify whether the following two statements about reversible processes in thermodynamics are correct or incorrect.

Statement A: A reversible process is defined as a process that can be reversed without leaving any trace on the surroundings.

Statement B: The net heat and the net work exchange between the system and the surroundings is zero for the combined (original and reverse) process.

Ans

✓ 1. Both Statement A and Statement B are correct.

✗ 2. Both Statement A and Statement B are incorrect.

✗ 3. Statement A is correct, but Statement B is incorrect.

✗ 4. Statement A is incorrect, but Statement B is correct.

Question ID : **630680197863**
Status : **Answered**
Chosen Option : **1**

Q.22 Based on the two given statements related to composite bars, select the correct answer.

Statement A: Total applied load to composite bar is equal to the sum of load of individual members.

Statement B: The deformation in each bar must be equal.

Ans
1. Statement A is correct, but statement B is incorrect.
2. Both statement A and statement B are incorrect.
3. Both statement A and statement B are correct.
4. Statement A is incorrect, but statement B is correct.

Question ID : **630680197878**
Status : **Answered**
Chosen Option : **1**

Q.23 Which lubrication system is best suited for two-stroke cycle IC engines?

Ans
1. Wet sump lubricating system
2. Dry sump lubricating system
3. Mist lubrication system
4. Pressure feed lubricating system

Question ID : **630680197868**
Status : **Answered**
Chosen Option : **3**

Q.24 _____ is the ratio of work done on blades per kg of steam to energy supplied per kg of steam, of a steam turbine.

Ans
1. Volumetric efficiency
2. Ideal efficiency
3. Thermal efficiency
4. Blade efficiency

Question ID : **630680197869**
Status : **Answered**
Chosen Option : **4**

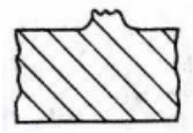
Q.25 Which of the following is the main constituent, apart from sand, of Green Sand Mould?

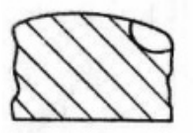
Ans
1. Clay
2. Mud
3. Ash
4. Chalk

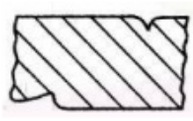
Question ID : **630680197871**
Status : **Answered**
Chosen Option : **2**

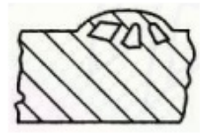
Q.26 Scab, which is a casting defect, is best represented by which of the following figures?

Ans

✗ 1. 

✗ 2. 

✗ 3. 

✓ 4. 

Question ID : **630680197873**
Status : **Not Answered**
Chosen Option : --

Q.27 _____ gears are used to connect two intersecting shafts.

Ans

✗ 1. Spur

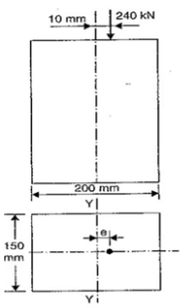
✗ 2. Herringbone

✗ 3. Worm

✓ 4. Bevel

Question ID : **630680197892**
Status : **Not Answered**
Chosen Option : --

Q.28 A rectangular column of width 200 mm and of thickness 150 mm carries a point load of 240 kN at an eccentricity of 10 mm as shown in the figure. The maximum and minimum stresses on the section are _____ N/m^2, respectively.



Ans

✓ 1. 10.4 and 5.6

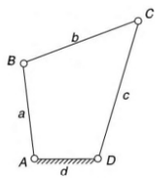
✗ 2. 5.6 and 10.4

✗ 3. 56 and 104

✗ 4. 104 and 56

Question ID : **630680197883**
Status : **Not Answered**
Chosen Option : --

Q.29 Consider a four-link mechanism shown in the figure. If '**a**' is to rotate a full circle, the shortest link should be _____.



Ans
1. ✗ b
2. ✓ d
3. ✗ a
4. ✗ c

Question ID : **630680197886**
Status : **Answered**
Chosen Option : **2**

Q.30 Uniformly varying load on beam is also known as _____.

Ans
1. ✓ triangular load
2. ✗ ideal load
3. ✗ rectangular load
4. ✗ trapezoidal load

Question ID : **630680197881**
Status : **Answered**
Chosen Option : **2**

Q.31 The pipe-head loss equals the change in height of the _____.

Ans
1. ✗ pressure head only
2. ✗ gravity head only
3. ✗ velocity head
4. ✓ hydraulic grade line

Question ID : **630680197857**
Status : **Answered**
Chosen Option : **1**

Q.32 A carburettor mixes _____ in a petrol engine.

Ans
1. ✗ air and lubricating oil
2. ✗ petrol and coolant
3. ✗ petrol and lubricating oil
4. ✓ petrol and air

Question ID : **630680197867**
Status : **Answered**
Chosen Option : **4**

Q.33 The welding process when a metal is melted to make a joint with no pressure involved is known as _____.

Ans

✔ 1. fusion welding

✗ 2. resistance welding

✗ 3. friction welding

✗ 4. forge welding

Question ID : **630680197874**
Status : **Answered**
Chosen Option : **1**

Q.34 If the available head, **H > 300 m**, for a flow which is in tangential direction, the suggested turbine is:

Ans

✗ 1. Francis

✗ 2. Propeller

✗ 3. Kaplan

✔ 4. Pelton

Question ID : **630680197861**
Status : **Answered**
Chosen Option : **4**

Q.35 Based on the two given statements about Watt Governor, select the correct answer.

Statement A: The height of the governor increases with increase in speed and decreases with decrease in speed.

Statement B: Variation in the height of the governor is appreciable for low values of speed and not at higher values of speed.

Ans

✗ 1. Statement A is correct, but statement B is incorrect.

✗ 2. Both statement A and statement B are correct.

✗ 3. Both statement A and statement B are incorrect.

✔ 4. Statement A is incorrect, but statement B is correct.

Question ID : **630680197893**
Status : **Answered**
Chosen Option : **3**

Q.36 Based on the two given statements for the entropy change of a system during an internally reversible isothermal heat transfer process, choose the correct answer.

Statement A: Losing heat is the only way the entropy of the system can be decreased.

Statement B: The entropy change of the system can be positive or negative, depending on the direction of heat transfer.

Ans

✗ 1. Both statement A and statement B are incorrect.

✗ 2. Statement A is incorrect, but statement B is correct.

✔ 3. Both statement A and statement B are correct.

✗ 4. Statement A is correct, but statement B is incorrect.

Question ID : **630680197866**
Status : **Answered**
Chosen Option : **3**

Q.37 Based on the two given statements, select the correct answer.

Statement A: The first law of thermodynamics is also known as the conservation of momentum principle.

Statement B: For all adiabatic processes between two specified states of a closed system, the net work done is the same regardless of the nature of the closed system and the details of the process.

Ans

✔ 1. Statement A is incorrect, but statement B is correct.

✗ 2. Statement A is correct, but statement B is incorrect.

✗ 3. Both statement A and statement B are incorrect.

✗ 4. Both statement A and statement B are correct.

Question ID : **630680197862**
Status : **Answered**
Chosen Option : **1**

Q.38 Which of the following statement about a flywheel is NOT correct?

Ans

✗ 1. It can smoothen the variations in shaft speed.

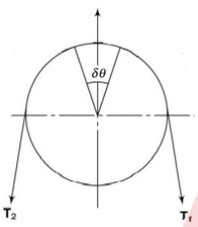
✔ 2. It can reduce friction in the shaft.

✗ 3. It can reduce undesirable transient loads.

✗ 4. It is used to store energy.

Question ID : **630680197888**
Status : **Answered**
Chosen Option : **2**

Q.39 The ratio to tension T_1 and T_2 flat belt drive shown in the figure is (μ is the coefficient of friction between belt and pully):



Ans

✔ 1. $e^{\mu\theta}$

✗ 2. $\log_e(\mu\theta)$

✗ 3. $\log_e\left(\frac{\mu\theta}{2}\right)$

✗ 4. $e^{\mu\theta/2}$

Question ID : **630680197891**
Status : **Not Answered**
Chosen Option : **--**

Q.40 _____ is the relationship between Young's Modulus of rigidity (E), Modulus of rigidity (G), and Poisson's ratio (μ).

Ans

✗ 1. $E = 2G(1 - \mu)$

✗ 2. $E = 3G(1 - 2\mu)$

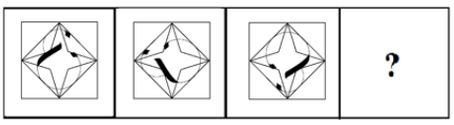
✗ 3. $E = 3G(1 + 2\mu)$

✓ 4. $E = 2G(1 + \mu)$

Question ID : **630680197879**
Status : **Answered**
Chosen Option : **1**

Section : **Reasoning**

Q.1 Select the figure from among the given options that can replace the question mark (?) in the following series.



Ans

✓ 1. 

✗ 2. 

✗ 3. 

✗ 4. 

Question ID : **630680197899**
Status : **Answered**
Chosen Option : **1**

Q.2 In a certain code language, 'BITTER' is coded as 'CHUSFQ' and 'BOTTLE' is coded as 'CNUSMD'. How will 'BUTTER' be coded in that language?

Ans
✗ 1. CTUUFQ
✗ 2. CTUSDQ
✗ 3. CTSUFQ
✓ 4. CTUSFQ

Question ID : **630680197896**
Status : **Answered**
Chosen Option : **4**

Q.3 If '×' means 'subtraction', '+' means 'division', '−' means 'addition' and '÷' means 'multiplication', what will be the value of the following expression?

$10 + [\{(15 - 7) \times (2 \div 3)\} + (10 \times 2)]$

Ans
✓ 1. 5
✗ 2. 10
✗ 3. 1
✗ 4. 2

Question ID : **630680197903**
Status : **Answered**
Chosen Option : **1**

Q.4 If ' − ' means 'division', '×' means 'addition', '÷' means 'multiplication' and '+' means 'subtraction', what will be the value of the following expression?

$[\{(10 + 4) \times (16 \times 2)\} - (2 \div 3)] \div 2$

Ans
✗ 1. 10
✓ 2. 8
✗ 3. 4
✗ 4. 2

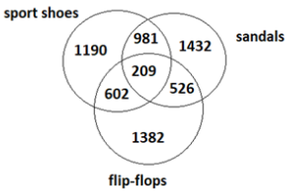
Question ID : **630680197902**
Status : **Answered**
Chosen Option : **2**

Q.5 Eight people, A, D, K, L, M, N, O and P, are sitting around a square table, facing the centre of the table. Four of them are sitting at the corners, while the rest are sitting at the exact centre of the sides. K is exactly between D and L. N and L are diagonally opposite to each other. A is exactly between N and P. P, at a corner, is exactly between O and A and is second to the left of L. Who is sitting exactly between N and D?

Ans
✗ 1. L
✗ 2. O
✗ 3. A
✓ 4. M

Question ID : **630680197894**
Status : **Answered**
Chosen Option : **4**

Q.6 Study the given diagram carefully and answer the question that follows. The numbers in different sections indicate the numbers of people who like different footwear.



How many people like sport shoes?

Ans
1. 2982
2. 2171
3. 2380
4. 1190

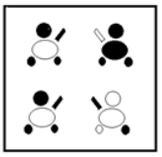
Question ID : **630680197895**
Status : **Answered**
Chosen Option : **1**

Q.7 P is the daughter of Q. M is the sister of S. T is the husband of R. S is the brother of Q. R is the mother of M. How is M related to T?

Ans
1. Daughter
2. Sister
3. Son
4. Mother

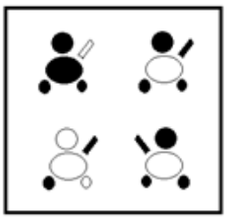
Question ID : **630680197897**
Status : **Answered**
Chosen Option : **3**

Q.8 Select the correct mirror image of the given figure when the mirror is placed at the right side.

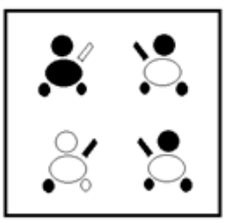


Ans

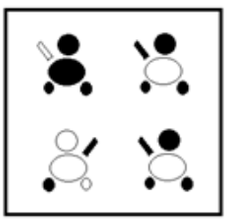
✗ 1.



✓ 2.



✗ 3.



✗ 4.

Question ID : **630680197900**
Status : **Answered**
Chosen Option : **2**

Q.9 Select the number from among the given options that can replace the question mark (?) in the following series.

19, 24, 31, 40, 51, ?

Ans

✗ 1. 62

✗ 2. 60

✗ 3. 66

✓ 4. 64

Question ID : **630680197901**
Status : **Answered**
Chosen Option : **4**

Q.10 Select the option that is related to the fifth letter-cluster in the same way as the second letter-cluster is related to the first letter-cluster and the fourth letter-cluster is related to the third letter-cluster.

PVC : KEX :: HMT : SNG :: OLA : ?

Ans
1. ✗ MOZ
2. ✗ LQZ
3. ✓ LOZ
4. ✗ LPZ

Question ID : **630680197898**
Status : **Answered**
Chosen Option : **3**

Section : **Quantitative Aptitude**

Q.1 Initially, Amith has ₹2,500 in his wallet then he increased it by 8%. Once again he increased his amount by 12%. What is the final value of the money in his wallet?

Ans
1. ✗ ₹3,126
2. ✗ ₹3,154
3. ✗ ₹3,008
4. ✓ ₹3,024

Question ID : **630680197908**
Status : **Answered**
Chosen Option : **4**

Q.2 If the average of a positive integer and its square is 435, then the number is:

Ans
1. ✓ 29
2. ✗ 23
3. ✗ 21
4. ✗ 25

Question ID : **630680197907**
Status : **Answered**
Chosen Option : **1**

Q.3 The marked price of a silver ring is ₹4,500. A man bought the same for ₹3,366 after getting two successive discounts, the first being 12%. What was the second discount rate?

Ans
1. ✗ 17%
2. ✓ 15%
3. ✗ 19%
4. ✗ 11%

Question ID : **630680197909**
Status : **Answered**
Chosen Option : **2**

Q.4 The smallest number that must be subtracted from 1876 to make it a perfect square is:

Ans
✗ 1. 35
✗ 2. 23
✗ 3. 31
✓ 4. 27

Question ID : **630680197904**
Status : **Answered**
Chosen Option : **4**

Q.5 The speed of a bus increases by 6 km/h after every two hours. If the bus covers a distance of 90 km in the first two hours, then the total distance covered by the bus in 14 hours will be:

Ans
✓ 1. 882 km
✗ 2. 902 km
✗ 3. 886 km
✗ 4. 910 km

Question ID : **630680197910**
Status : **Answered**
Chosen Option : **1**

Q.6 The cost of the paint is ₹365 per kg. If 1 kg of paint covers 12 square feet, how much will it cost to paint outside of a cube having 10 feet on each side?

Ans
✗ 1. ₹16,350
✗ 2. ₹17,550
✓ 3. ₹18,250
✗ 4. ₹19,050

Question ID : **630680197913**
Status : **Answered**
Chosen Option : **3**

Q.7 If n is the greatest number that can divide 7747, 8657 and 7292 leaving the same remainder 12, then the sum of the digits in n is:

Ans
✗ 1. 21
✓ 2. 14
✗ 3. 15
✗ 4. 18

Question ID : **630680197905**
Status : **Answered**
Chosen Option : **2**

Q.8 45 men can complete a work in 15 days. 3 days after they started working, 5 more men joined them. How many days will they now take to complete the remaining work?

Ans
✗ 1. 10.5
✗ 2. 10.2
✓ 3. 10.8
✗ 4. 10.6

Question ID : **630680197911**
Status : **Answered**
Chosen Option : **3**

Q.9 If the perimeters of two squares are 48 m and 80 m, then the perimeter of a third square whose area is equal to the difference between the areas of the two squares is:

Ans
✓ 1. 64 m
✗ 2. 68 m
✗ 3. 72m
✗ 4. 56 m

Question ID : **630680197912**
Status : **Answered**
Chosen Option : **1**

Q.10 The average of the numbers between 120 and 190 which are divisible by 7 is:

Ans
✓ 1. 157.5
✗ 2. 158.3
✗ 3. 156.7
✗ 4. 155.8

Question ID : **630680197906**
Status : **Answered**
Chosen Option : **1**

Section : **General Awareness**

Q.1 **पादप साम्राज्य को पाँच उपसमूहों में वर्गीकृत किया गया है। निम्नलिखित में से कौन उनमें से एक नहीं है?**

Ans
✗ 1. टेरिडोफाइटा
✗ 2. थैलोफाइटा
✓ 3. ओफियोग्लोसेल्स
✗ 4. जिम्नोस्पर्म

Question ID : **630680197920**
Status : **Answered**
Chosen Option : **3**

Q.2 **In which of the following years did Debendranath Tagore write Brahmo Covenant?**

Ans
✓ 1. 1843
✗ 2. 1840
✗ 3. 1847
✗ 4. 1839

Question ID : **630680197915**
Status : **Not Answered**
Chosen Option : **--**

Q.3 Which of the following insurance companies has launched India's 1st dental health insurance plan?

Ans
✔ 1. PNB MetLife India Insurance
✘ 2. HDFC Life Insurance
✘ 3. ICICI Prudential Life Insurance
✘ 4. Tata AIA Life Insurance

Question ID : **630680197918**
Status : **Answered**
Chosen Option : **3**

Q.4 Which of the following Buddhist temples is NOT located in Bihar?

Ans
✘ 1. Metta Buddharam Temple
✔ 2. Mahaparinirvana Temple
✘ 3. Daijokyo Buddhist Temple
✘ 4. Mahabodhi Temple

Question ID : **630680197916**
Status : **Answered**
Chosen Option : **2**

Q.5 Which of the following Articles provides two rights, namely, Right to Life and Right to Personal Liberty?

Ans
✘ 1. Article 25
✘ 2. Article 19
✘ 3. Article 23
✔ 4. Article 21

Question ID : **630680197921**
Status : **Answered**
Chosen Option : **2**

Q.6 In which of the following years did Mizoram become the 23rd state of Indian Union?

Ans
✘ 1. 1975
✘ 2. 2000
✔ 3. 1987
✘ 4. 1972

Question ID : **630680197922**
Status : **Answered**
Chosen Option : **3**

Q.7 The HS200 solid rocket booster is 20 m long with diameter of _____ m.

Ans
✘ 1. 1.8
✘ 2. 4.6
✔ 3. 3.2
✘ 4. 2.4

Question ID : **630680197914**
Status : **Answered**
Chosen Option : **2**

Q.8 Manoj Kumar Nambiar was re-elected as MFIN Chairperson in 2020. In which of the following years was this association founded?

Ans
✔ 1. 2009
✘ 2. 2011
✘ 3. 2007
✘ 4. 2012

Question ID : **630680197917**
Status : **Not Answered**
Chosen Option : **--**

Q.9 How many medals did India win in Archery Asia Cup 2022 Stage-2 campaign held in Sulaymaniyah, Iraq?

Ans
✘ 1. 15
✘ 2. 12
✔ 3. 14
✘ 4. 11

Question ID : **630680197923**
Status : **Answered**
Chosen Option : **3**

Q.10 Which of the following hills is NOT situated in Andhra Pradesh?

Ans
✔ 1. Dirang
✘ 2. Horsley Hills
✘ 3. Papikondalu
✘ 4. Araku Valley

Question ID : **630680197919**
Status : **Answered**
Chosen Option : **1**

Section : **English Language**

Q.1 Select the most appropriate synonym of the given word to fill in the blank.

AMIICABLE
The company hoped to reach a _____ agreement regarding the acquisition of the other company.

Ans
✔ 1. friendly
✘ 2. true
✘ 3. trustworthy
✘ 4. cunning

Question ID : **630680197926**
Status : **Answered**
Chosen Option : **1**

Q.2 Sentences of a paragraph are given below in jumbled order. Arrange the sentences in the correct order to form a meaningful and coherent paragraph.

A. The shipment, labelled as beans, was shipped out of Congo in February and went through Malaysia before reaching the Bangkok port.
B. 739 elephant tusks, bound for Laos, were seized upon arrival at a port in Bangkok on Saturday.
C. According to our Intelligence reports, ivory from Africa might be smuggled with other products to go through the Laotian border," the Customs Department's director-general Somchai Sujjapongse said.
D. "We have been following the (shipment) for two months.

Ans
✗ 1. CABD
✗ 2. ACDB
✗ 3. BCDA
✓ 4. BADC

Question ID : **630680197930**
Status : **Answered**
Chosen Option : **4**

Q.3 Select the most appropriate option to fill in the blanks.

No one has _____ right to say _____ uncivil thing than to act one.

Ans
✗ 1. a; the
✗ 2. the; no word required
✗ 3. no word required; an
✓ 4. the; an

Question ID : **630680197924**
Status : **Answered**
Chosen Option : **4**

Q.4 Select the most appropriate meaning of the given idiom.

Pull yourself together

Ans
✗ 1. Make the most of the given situation
✗ 2. Try to understand other's difficulty
✓ 3. Recover control of one's emotions
✗ 4. Get adjusted with everybody

Question ID : **630680197929**
Status : **Answered**
Chosen Option : **1**

Q.5 Select the most appropriate option to fill in the blank.

Let us warn the children _____ from jumping over the wall.

Ans
✗ 1. refraining
✗ 2. refrains
✗ 3. refrain
✓ 4. to refrain

Question ID : **630680197925**
Status : **Answered**
Chosen Option : **4**

Q.6 **Select the most appropriate meaning of the given idiom.**

Get out of hand

Ans
✔ 1. To be difficult to control
✘ 2. To get irritated
✘ 3. To give away something
✘ 4. To leave a task incomplete

Question ID : **630680197928**
Status : **Answered**
Chosen Option : **1**

Q.7 **The following sentence has been divided into parts. One of them may contain an error. Select the part that contains the error in spelling from the given options. If you don't find any error, mark 'No error' as your answer.**

The absence of light / has a conciderable effect / on plants and animals.

Ans
✔ 1. has a conciderable effect
✘ 2. No error
✘ 3. on plants and animals.
✘ 4. The absence of light

Question ID : **630680197927**
Status : **Answered**
Chosen Option : **1**

Comprehension:

Read the given passage and answer the questions that follow.
Language, as we have seen, seems to be a highly developed form of animal signalling. But there is a missing link in the chain. How, and when, did we start to talk?

This is a problem of interest mainly to ethologists (students of animal behaviour), and one which has not yet been solved. Most linguists regard this fascinating topic as being outside the realm of linguistics proper. They are more interested in studying actual language than in speculating about its origins.
But although how language began is a puzzle, why language began seems rather clearer. Possibly, it began because humans needed a greater degree of cooperation with each other in order to survive, and this cooperation required efficient communication. Consequently, the primary function of language is to impart factual information and to convey essential commands.
But language can also be used to communicate feelings and emotions. This aspect of language is not as well developed as 'information talking', because humans, like other primates, can convey emotions by screams, grunts, sobs, gestures and so on. So, they need language only to confirm and elaborate these more primitive signals. In addition, there is the language of social chitchat, the meaningless small talk of everyday life. "Hello, how nice to see you. How are you? Isn't the weather terrible?" This social patter has been called Phatic communion and is primarily a device to maintain social contact on a friendly level. Some ethologists call it 'grooming talking' and suggest that it is substitute for the friendly grooming indulged in by the monkeys.
There are other biologically less important functions of language. Humans may use language for purely aesthetic reasons. In writing poetry, for example, people manipulate words in the same way as they might model clay or paint a picture. Or they may talk in order to release nervous tension, a function seen when people mutter to themselves in anger and frustration.

SubQuestion No : 8

Q.8 **Which of the following is NOT a primitive signal?**

Ans
✘ 1. Grunts
✔ 2. Talk
✘ 3. Gestures
✘ 4. Screams

Question ID : **630680197933**
Status : **Answered**
Chosen Option : **2**

Comprehension:

Read the given passage and answer the questions that follow.
Language, as we have seen, seems to be a highly developed form of animal signalling. But there is a missing link in the chain. How, and when, did we start to talk?

This is a problem of interest mainly to ethologists (students of animal behaviour), and one which has not yet been solved. Most linguists regard this fascinating topic as being outside the realm of linguistics proper. They are more interested in studying actual language than in speculating about its origins.
But although how language began is a puzzle, why language began seems rather clearer. Possibly, it began because humans needed a greater degree of cooperation with each other in order to survive, and this cooperation required efficient communication. Consequently, the primary function of language is to impart factual information and to convey essential commands.
But language can also be used to communicate feelings and emotions. This aspect of language is not as well developed as 'information talking', because humans, like other primates, can convey emotions by screams, grunts, sobs, gestures and so on. So, they need language only to confirm and elaborate these more primitive signals. In addition, there is the language of social chitchat, the meaningless small talk of everyday life. "Hello, how nice to see you. How are you? Isn't the weather terrible?" This social patter has been called Phatic communion and is primarily a device to maintain social contact on a friendly level. Some ethologists call it 'grooming talking' and suggest that it is substitute for the friendly grooming indulged in by the monkeys.
There are other biologically less important functions of language. Humans may use language for purely aesthetic reasons. In writing poetry, for example, people manipulate words in the same way as they might model clay or paint a picture. Or they may talk in order to release nervous tension, a function seen when people mutter to themselves in anger and frustration.

SubQuestion No : 9

Q.9 **Which is a less important function of language according to the passage?**

Ans

✗ 1. To impart factual information

✓ 2. To release nervous tension

✗ 3. To convey essential commands

✗ 4. To communicate feelings and emotions

Question ID : **630680197934**
Status : **Answered**
Chosen Option : **2**

Comprehension:

Read the given passage and answer the questions that follow.
Language, as we have seen, seems to be a highly developed form of animal signalling. But there is a missing link in the chain. How, and when, did we start to talk?

This is a problem of interest mainly to ethologists (students of animal behaviour), and one which has not yet been solved. Most linguists regard this fascinating topic as being outside the realm of linguistics proper. They are more interested in studying actual language than in speculating about its origins.
But although how language began is a puzzle, why language began seems rather clearer. Possibly, it began because humans needed a greater degree of cooperation with each other in order to survive, and this cooperation required efficient communication. Consequently, the primary function of language is to impart factual information and to convey essential commands.
But language can also be used to communicate feelings and emotions. This aspect of language is not as well developed as 'information talking', because humans, like other primates, can convey emotions by screams, grunts, sobs, gestures and so on. So, they need language only to confirm and elaborate these more primitive signals. In addition, there is the language of social chitchat, the meaningless small talk of everyday life. "Hello, how nice to see you. How are you? Isn't the weather terrible?" This social patter has been called Phatic communion and is primarily a device to maintain social contact on a friendly level. Some ethologists call it 'grooming talking' and suggest that it is substitute for the friendly grooming indulged in by the monkeys.
There are other biologically less important functions of language. Humans may use language for purely aesthetic reasons. In writing poetry, for example, people manipulate words in the same way as they might model clay or paint a picture. Or they may talk in order to release nervous tension, a function seen when people mutter to themselves in anger and frustration.

SubQuestion No : 10

Q.10 Which of the given statements are true?

A. Language is a highly sophisticated form of human sign communication.
B. Ethologists are interested in the study of animal behaviour.
C. The main function of language is to convey emotions and feelings.

Ans

✗ 1. A, B and C all are true

✗ 2. A and B are true.

✓ 3. Only B is true.

✗ 4. A and C are true

Question ID : **630680197932**
Status : **Answered**
Chosen Option : **1**