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* Correct Answer is in Bold and slightly bigger
* Candidate selected option is Underlined

Physics

Q2775341 If a charge moves in an electric field, the work done is converted into

Score Obtained : -0.25

A) electrostatic energy
B) potential energy
C) current
D) kinetic energy

Q2775097 A cyclist comes to a skidding stop in $10\ m$. During this process, the force on the bicycle due to the road is $200\ N$ and is directly opposed to the motion. The work done by the cycle on the road is

Score Obtained : -0.25

A) $+200\ J$
B) Zero
C) $-200\ J$
D) $2000\ J$

Q2775269 Lens which diverges light from a point source is

Score Obtained : 1.0

A) Concave lens
B) Biconcave lens
C) Convex Lens
D) Biconvex Lens

Q2775268 The number of images formed by an object placed between two parallel mirrors is

Score Obtained : 1.0

A) 4
B) infinite
C) 2
D) 1

Q2775265 The device which can focus the image of a distant object on a screen placed on the same side as the object is

Score Obtained : -0.25

A) Convex mirror
B) Concave lens
C) Convex lens
D) Concave mirror

Q2775072 Among the following physical quantities, the only one that has an SI unit but is dimensionless is

Score Obtained : -0.25

A) Amount of substance

B) Solid angle

C) Luminous Intensity

D) Reynolds number

Q2775603 A hole is drilled in a copper sheet. The diameter of the hole is 4.24 cm at 27°C. The change in the diameter of the hole when the sheet is heated to 227°C is
($\propto$ of copper = $1.7 \times 10^{-5}\ K^{-1}$)

Score Obtained : 0.0

A) 1.44×10^{-4}m

B) 1.44×10^{-4}cm

C) 1.44×10^{-3}m

D) 1.44×10^{-2}m

Q2785857 Which of the following nanomaterials are used in the treatment of breast cancer cells?

Score Obtained : 0.0

A) Gold coated nanoparticles

B) Graphene sheets

C) Carbon nanorods

D) Fe nanoparticles

Q2775547 The branch of physics which deals with the interconversion of heat and other forms of energy and deals with the concepts of heat and temperature is

Score Obtained : 1.0

A) Thermodynamics

B) Kinematics

C) Dynamics

D) Mechanics

Q2785828 An electromagnetic wave of wavelength 5 nm belongs to

Score Obtained : 0.0

A) Soft X-ray

B) Ultravoilet radiation

C) γ-ray

D) Hard X-ray

Q2775549 The thermodynamic quantity which is a measure of the total heat content of the system is

Score Obtained : 0.0

A) Enthalpy

B) Internal Energy

C) Entropy

D) Free Energy

Q2785842 The famous Lycurgus cup kept in the British museum looks green in reflected light and red in transmitted light. Which of the following nanoparticles are responsible for the green colour?

Score Obtained : 0.0

A) Carbon nanotubes

B) Iron nanoparticles

C) Silver nanoparticles

D) Gold nanoparticles

Q2775623 Acceleration that causes reduction in "speed" is called

Score Obtained : 1.0

A) Opposite of acceleration

B) Deceleration

C) Zero acceleration

D) Lower speed

Q2785820 If the temperature of the surroundings increase from 25°C to 25.1°C, what is the percentage increase in the speed of sound in air?. (Speed of sound in air = 332 m/s)

Score Obtained : 0.0

A) 0.18%

B) 3.60%

C) 1.80%

D) 0.36%

Q2775620 Frame of reference is a mathematical construct to specify

Score Obtained : 1.0

A) position or location of a displaced point object in time

B) position or location of a point object in space

C) position or location of a space object in point

D) position or location of a point object in time

Q2785819 FM radio stations work in the frequency band 88 MHz - 108 MHz. Find the wavelength range of the radio waves used in FM broadcasting.

Score Obtained : 0.0

A) 2.8 cm - 3.4 cm

B) 0.28 m - 3.4 m

C) 2.8 m - 3.4 m

D) 0.28 cm - 0.34 cm

Q2775599 A bimetallic strip is made of aluminium and steel $(\alpha_{Al} > \alpha_{steel})$. On heating, the strip will

Score Obtained : 0.0

A) Get twisted

B) Will bend with aluminium on concave side

C) Will bend with steel on concave side

D) Remain straight

Q2775552 The pressure 'P' of an ideal gas in terms of its mean kinetic energy per unit volume 'E' is equal to

Score Obtained : 0.0

A) P = E/2

B) P = E/3

C) P = 3E/2

D) P = 2E/3

Q2775619 Motion is a state, which indicates

Score Obtained : 1.0

A) change of direction
B) change of displacement
C) change of position
D) change of object

Q2775357 The role of plane mirror and glass sheet in a solar cooker is

Score Obtained : 1.0

A) to radiate solar heat
B) to reflect solar heat into the solar cooker thereby increasing its temperature
C) to focus solar energy into the cooker
D) for protection of cooker

Q2775362 Which of the following gases is a primary constituent of both natural gas and biogas?

Score Obtained : 1.0

A) Methane
B) Hydrogen
C) Nitrogen
D) Oxygen

Q2775096 A body of mass 0.5 kg travels in a straight line with velocity $v = ax^{3/2}$ where $a = 5m^{-1/2}s^{-1}$. The work done by the net force during its displacement from x = 0 to x = 2m is

Score Obtained : 0.0

A) 100 J
B) 1.5 J
C) 10 J
D) 50 J

Q2785829 Which of the following X-ray line has the photons of highest energy?

Score Obtained : 0.0

A) $K_{\alpha 1}$ - line
B) $K_{\alpha 2}$ - line
C) $K_{\beta 1}$ - line
D) $K_{\beta 2}$ - line

Q2785821 Which of the following phenomena can't be observed in sound?

Score Obtained : -0.25

A) Diffraction
B) Refraction
C) Reflection
D) Polarization

Q2775336 Two point charges of + 3C and + 9C repel each other with a force of 27 N. Charges of - 3C are given to each of these charges, then the force of attraction is

Score Obtained : 1.0

A) 9 N
B) 27 N

C) Zero

D) 18 N

Q2775601 A sphere, a cube and a thin circular plate all of same material and same mass are initially heated to same high temperature. Then

Score Obtained : -0.25

A) Cube will cool fastest and plate the slowest

B) Sphere will cool fastest and cube the slowest

C) Plate will cool fastest and cube the slowest

D) Plate will cool fastest and sphere the slowest

Q2775602 The equation of state for 5g of oxygen at a pressure P and temperature T, when occupying a volume V will be

Score Obtained : 0.0

A) PV=RT

B) PV=(32/5) RT

C) PV=(5/32) RT

D) PV=5RT

Q2775108 A mass less spring with a force constant $K = 40\ N/m$ hangs vertically from the ceiling. A $0.2\ kg$ block is attached to the free end of the spring and held in such a position that the spring has the natural length and suddenly released. The maximum elastic strain energy stored in the spring is (take $g = 10\ m/s^2$)

Score Obtained : 0.0

A) $0.2\ J$

B) $0.4\ J$

C) $0.1\ J$

D) $0.05\ J$

Q2785855 Arrange the folowing metric prefixes in ascending order: femto; peta; mirco; kilo; nano

Score Obtained : -0.25

A) peta; kilo; micro; nano; femto

B) femto; nano; micro; kilo; peta

C) femto; peta; nano; micro; kilo

D) peta; femto; micro, nano; kilo

Q2785856 What is a nanometer?

Score Obtained : 1.0

A) one-millionth of a meter

B) one-billionth of a meter

C) one-trillionth of a meter

D) one-thousandth of a meter

Q2775346 A polythene piece is rubbed with wool is found to have negative charge of 3 x 10^{-7} C. Find the number electrons transferred (from which to which)?

Score Obtained : 0.0

A) 1.87 x 10^{-12} from wool to polythene

B) 18.7 x 10^{12} from polythene to wool

C) 18.7 x 10^{12} from wool to polythene

D) 1.87 x 10^{12} from polythene to wool

Q2775399 Which among the following is NOT a renewable Source of Energy?

Score Obtained : 1.0

A) Flowing water

B) Fossil fuels

C) Hydro power

D) Wind

Q2775398 What is an Example of non renewable Source of Energy?

Score Obtained : 1.0

A) Wind

B) Solar energy

C) Natural gas

D) Bio power

Q2775079 Find the dimensional formula of $[(G^2M^5)/(L^2S)]^{1/3}$, where L, S, G and M represent angular momentum, stress, gravitational constant and mass respectively.

Score Obtained : 0.0

A) [T]

B) [L]

C) $[L^1T^{-1}]$

D) [M]

Q2775073 In SI system, which of the following is NOT a fundamental or base physical quantity?

Score Obtained : 1.0

A) Amount of substance

B) Plane angle

C) Electric current

D) Luminous Intensity

Q2775074 A body of mass m initially at rest explodes into two fragments having masses m/4 and 3m/4 respectively. The lighter fragment is thrown off with a velocity 30(i - j) m/s, where i and j are unit vectors along X-axis and Y-axis respectively. What is the velocity of the heavier fragment?

Score Obtained : 0.0

A) 30(i - j) m/s

B) 10(i - j) m/s

C) 10(j - i) m/s

D) 30(j - i) m/s

Q2775625 If the force acting on a particle is oblique with initial velocity then the motion of particle is called

Score Obtained : 1.0

A) Projectile motion

B) Circular motion

C) Curved motion

D) Linear motion

Q2775546 The efficiency 'η' of an engine which absorbs Q_1 heat from the source and rejects Q_2 to the sink is given by

Score Obtained : 0.0

A) $\eta = 1 - Q_2/Q_1$

B) $\eta = Q_1/Q_2 - 1$

C) $\eta = Q_2/Q_1 - 1$

D) $\eta = 1 - Q_1/Q_2$

Q2775540 Thermodynamic state variables are of two types intensive and extensive. The quantity which best suits for the example of intensive variable is

Score Obtained : 0.0

A) Internal energy

B) Volume

C) Mass

D) Density

Q2775614 The value of acceleration due to gravity "g" of the earth is

Score Obtained : 1.0

A) g = 9.8 ms^2

B) g = 9.8 cm/s^2

C) g = 9.8 m/s^2

D) g = 9.8 cm s^2

Q2775270 The power of a convex lens of focal length 50 cm is

Score Obtained : 1.0

A) +2D

B) +50D

C) -2D

D) -50D

Q2775071 Among the following pairs of physical quantities, the only pair which does NOT have the same dimensional formula is

Score Obtained : 0.0

A) Momentum and impulse

B) Force and weight

C) Linear momentum and Planck's constant

D) Entropy and Boltzmann constant

Q2785833 A Coolidge tube operates at an accelerating potential of 20 keV. Find the minimum wavelength of X-ray emitted from the tube.

Score Obtained : 0.0

A) 0.94×10^{-10} m

B) 0.62×10^{-10} m

C) 0.31×10^{-10} m

D) 1.24×10^{-10} m

Q2785831 Statement 1: A photon has a zero rest mass.
Statement 2: It is impossible to slow down a photon.

Score Obtained : 0.0

A) Statement 1 is false but statement 2 is true.

B) Statement 1 is true but statement 2 is false.

C) Both the statements are correct but statement 2 is not the inference of statement 1.

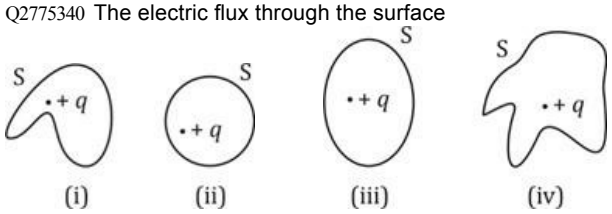
D) Both the statements are correct and statement 2 is the inference drawn from statement 1.

Q2785824 In which of the following materials the speed of sound is maximum?

Score Obtained : 1.0

A) Aluminium
B) Lead
C) Rubber
D) Copper

Q2775340 The electric flux through the surface



Score Obtained : 0.0

A) In figure (iv) is the largest
B) Is the same for all the figures
C) In figure (i) is the largest
D) In figures (ii) and (iii) are smaller than figures (i) and (iv)

Q2775342 Relative permittivity of a medium may be expressed in terms of the ratio of

Score Obtained : 0.0

A) charges in medium and vacuum
B) charges in vacuum and medium
C) forces between charges in vacuum and medium
D) forces between charges in medium and vacuum

Q2775266 The ratio of velocity of light in water to that in glass if the absolute refractive indices of water and glass are 4/3 and 3/2 is

Score Obtained : -0.25

A) 9/8
B) 2/1
C) 8/9
D) 1/2

Q2775107 A running man has half the kinetic energy that of a running boy of half his mass. When the man speeds up by $1.0\ m/s$, he has as the same kinetic energy as the boy. What is the original speed of the man in m/s?

Score Obtained : 0.0

A) $\sqrt{2}-2$
B) $\sqrt{2}+1$
C) $\sqrt{2}-1$
D) $\sqrt{2}+2$

Q2775105 A body of mass 'm' starting from rest is acted on by a force producing a velocity $v=\sqrt{k\times s}$ where k is a constant and s is displacement. The work done by the force in the first 't' seconds is

Score Obtained : 0.0

A) $m^2k^2t^2/8$
B) $mk^2t^2/8$

C) $mk^2t^2/4$

D) m^2k^2t

Q2786648 Galvanization is deposition of

Score Obtained : 1.0

A) Copper on iron

B) Aluminium oin iron

C) Zinc on iron

D) Tin on iron

Q2780524 Which one among the following combinations is CORRECT about shape of orbital?

Score Obtained : -0.25

A) s-spherical; p-dumbbell; d-double bumb bell and doughnut; f-diffused

B) s-spherical; p-dumbbell; d-double bumb bell; f-disc

C) s-doughnut; p-dumbbell; d-double bumb bell and doughnut; f-disc

D) s-disc; p-dumbbell; d-double bumb bell and doughnut; f-diffused

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Q2786603 Permanent hardness can be removed by adding

Score Obtained : 1.0

A) Sodium bicarbonate

B) Sodium carbonate

C) Bleaching powder

D) Chlorine water

Q2786599 The name of water in IUPAC system is

Score Obtained : -0.25

A) Hydrogen hydroxide

B) Water

C) Hydrogen monoxide

D) Oxidane

Q2780522 For Na, the principle, azimuthal and spin quantum numbers are, respectively,

Score Obtained : 0.0

A) 3,1,+1/2

B) 3,1,-1/2

C) 3, 0, -1/2

D) 3,0,+1/2

Q2780532 Which of the following combination is CORRECTLY explaining particle nature of electromagnetic wave?

Score Obtained : 0.0

A) Planck-distribution of intensity of the radiation from photoelectric effect as a function of its amplitude

B) Planck-distribution of intensity of the radiation from black body as a function of its wavelength

C) Planck-distribution of intensity of the radiation from black body as a function of its amplitude

D) Planck-distribution of intensity of the radiation from photoelectric effect as a function of its wavelength

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Q2786530 Which one of the following cutting fluids is used while machining cast iron?

Score Obtained : 0.0

A) Dry air

B) Mineral oil

C) Soluble oil

D) Water

Q2780868 The emf of the following three daniel cells are represented by E_1, E_2 and E_3, the decreasing order of their emf values is

I. $Zn/Zn^{++}(1M)\|Cu^{2+}(1M)/Cu$

II. $Zn/Zn^{++}(1M)\|Cu^{2+}(0.5M)/Cu$

III. $Zn/Zn^{++}(0.1M)\|Cu^{2+}(1M)/Cu$

Score Obtained : 0.0

A) $E_3 > E_1 > E_2$

B) $E_3 > E_2 > E_1$

C) $E_2 > E_3 > E_1$

D) $E_1 > E_2 > E_3$

Q2786529 Which of the following is the most commonly used lubrication system in an automobile?

Score Obtained : 0.0

A) Splash system

B) Petroil system

C) Gun system

D) Pressure system

Q2780870 The specific conductance of $0.01\,M\ NaCl$ solution is $120\times10^{-5}S\,cm^{-1}$. Its molar conductance is

Score Obtained : 0.0

A) $120\times10^{-5}S\,cm^2\,mol^{-1}$

B) $120\times10^{-3}S\,cm^2\,mol^{-1}$

C) $120\times10^{-7}S\,cm^2\,mol^{-1}$

D) $120\,S\,cm^2\,mol^{-1}$

Q2786528 Which of the following is the most important quality of any lubricant?

Score Obtained : 1.0

A) Viscosity

B) Specific heat

C) Specific gravity

D) Emulsification

Q2780869 The hydrogen electrode is dipped in a solution of pH = 4 at 25 °C. The potential of the cell is

Score Obtained : 0.0

A) 0.236 V

B) 0.18 V

C) -0.0147 V

D) -0.236 V

Q2786592 Which of the following statement is applicable for Thermo-plastics?

Score Obtained : -0.25

A) It can be molded again and again

B) It forms through an irreversible chemical reaction

C) It does not go chemical change when heated

D) Molecular mass ranges from 20000 - 500000

Q2785542 High noise level may create maximum problems for which category of people?

Score Obtained : 1.0

A) Middle aged people

B) Young people

C) People having age between 20-30 years

D) Old people and children

Q2786591 Which of the following elements is absent in plastic materials?

Score Obtained : 0.0

A) N

B) Fe

C) S

D) O

Q2785534 Which act was enacted in 1981 by Government of India to regulate and prevent pollution?

Score Obtained : 0.0

A) Water Pollution and Prevention Act

B) Environmental Protection Act

C) Environmental Pollution and Prevention Act

D) The Air (Prevention and Control of Pollution) Act,

Q2786482 Which one of the following elements prevents dezincification in brass?

Score Obtained : 0.0

A) Niobium

B) Arsenic

C) Lithium

D) Chromium

Q2786615 Most abundant element in earth's crust by weight is

Score Obtained : -0.25

A) silicon

B) aluminium

C) iron

D) oxygen

Q2786618 In nature most of the metals are found in

Score Obtained : 1.0

A) reduced form

B) both oxidised and reduced form

C) oxidised form

D) form of alloys

Q2786521 The MKS unit of measurement for removal of paint or varnish of a building is

Score Obtained : -0.25

A) cu m
B) numbers
C) sq m
D) m

Q2786522 Which of the following thermosetting plastics is used for making paints, varnishing electrical fittings, and as adhesives for plywood?

Score Obtained : 0.0

A) Urea formaldehyde
B) Polyesters casein
C) Phenol formaldehyde
D) Melamine formaldehyde

Q2780880 The amount of coulombs of electricity required to oxidise 1 mole of hydrogen peroxide to oxygen is :

Score Obtained : 0.0

A) 386000C
B) 2 C
C) 96500C
D) 48250C

Q2785533 Which of the following is man-made air pollution?

Score Obtained : 1.0

A) Poisonous gases released from earth quakes
B) Use of radioactive elements like uranium and thorium in nuclear reactors.
C) Forest fires
D) Cyclones and dust storms

Q2785536 Ozone layer protecting earth's surface from harmful UV rays is present in which layer of atmosphere?

Score Obtained : 0.0

A) Ionosphere
B) Exosphere
C) Troposphere
D) Stratosphere

Q2786649 Best quality steel is manufactured by

Score Obtained : 0.0

A) Electrical process
B) Simenes Martin's process
C) Bassemer's process
D) Crucible process

Q2786532 What is the main reason for corrosion of tubewell pipes?

Score Obtained : 1.0

A) The increased pumping rate

B) The discharge of highly alkaline water

C) The action of acidic water on the pipe

D) The low discharge from the tubewell

Q2786533 Which one of the following materials of construction will offer maximum corrosion resistance for a heat exchanger in marine environment?

Score Obtained : 0.0

A) Titanium

B) Admiralty brass

C) Stainless steel

D) Aluminium

Q2780521 The CORRECT combination about discovery-scientist pair among the following is

Score Obtained : 1.0

A) electron-Chadwick; Positron-Goldstein; Neutron-J.J.Thomson

B) electron-J.J.Thomson; Proton-Goldstein; Neutron-Chadwick

C) electron-J.J.Thomson; Proton-Chadwick; Neutron-Goldstein

D) electron-Goldstein; Proton-Goldstein; Neutron-J.J.Thomson

Q2780878 The amount of electricity required to deposit 1 mole of $CaCl_2$ form it's solution will be :

Score Obtained : 0.0

A) 193000C

B) 386000C

C) 96500 C

D) 48250C

Q2780892 The solution with highest conductivity is :

Score Obtained : 0.0

A) 1 mole of KCl in 500 cm^3 of the solution

B) 1 mole of KCl in 250 cm^3 of the solution

C) 1 mole of KCl in 100 cm^3 of the solution

D) 1 mole of KCl in 1000 cm^3 of the solution

Q2786647 Steel is heated to below red heat and then cooled slowly. The process refers to

Score Obtained : -0.25

A) Annealing

B) Hardening

C) Nitriding

D) Tempering

Q2786594 Which of the following is a common Plasticizer used in plastics?

Score Obtained : 0.0

A) Silicone

B) Neoprene

C) Bakelite

D) Esters

Q2786520 Which of the following is a type of paint coating failure related to aging?

Score Obtained : 0.0

A) Cratering
B) Wrinkling
C) Blushing
D) Undercutting

Q2780533 If the spin of both the two electrons in (2px)2 electrons in an electronic configuration are +1/2, then

Score Obtained : 0.0

A) it violates Hund's rule only; not Aufbau principle and Pauli's exclusion principle
B) it violates Pauli's exclusion principle only; not aufbau principle and Hund's rule
C) it violates Aufbau's principle only; not Hund's rule and Pauli's exclusion principle
D) it violates Hund's rule, Aufbau principle and Pauli's exclusion principle

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Q2780531 What is the effective nuclear charge of outermost electron in Be

Score Obtained : 0.0

A) 4 - 2.05 = 1.95
B) 4 - 3.05 = 0.95
C) 4 - 0.05 = 3.95
D) 4 - 1.05 = 2.95

Q2780523 Which one of the following combinations is CORRECT about quantum theory?

Score Obtained : 0.0

A) n-major energy level; l-shape and energy levels of subshell; m-possible number of orientation of subshells; s-direction of spin of electron
B) n-shape of shell; l-possible number of orientation of subshells; m-minor energy level; s-direction of spin of electron
C) n-major energy level; l-shape and energy levels of subshell; m-minor energy level; s-direction of spin of electron
D) n-major energy level; l-minor energy level; m-shape of subshell; s-direction of spin of electron

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Q2786593 The "vulcanization" of polyisoprene (rubber) is done by adding

Score Obtained : 1.0

A) Calcium
B) Sulphur
C) Phosphorus
D) Chlorine

Q2786531 Which of the following property of lubricant defines the temperature at which the vapour is given off from the oil?

Score Obtained : 0.0

A) Pour point
B) Flash point
C) Fire point
D) Boiling point

Q2786619 In thermit process, Aluminium acts as

Score Obtained : -0.25

A) a solder
B) an oxidising agent
C) a reducing agent
D) a flux

Q2786624 The reason for floating of ore particles in concentration by froth floatating process is that

Score Obtained : 0.0

A) they are hydrophobic
B) they are insoluble
C) they are light
D) they are changed

Q2786600 The molarity of pure water at 4°C is

Score Obtained : 0.0

A) 5 M
B) 5.5 M
C) 55.5 M
D) 2.5 M

Q2780520 Which one of the following combinations is WRONG in terms of atomic theory?

Score Obtained : 0.0

A) Bohr model-smallest orbit has the lowest energy
B) Dalton-plumpudding model
C) Rutherford-alpha scattering
D) Thomson-watermelon model

Q2785535 In which year, Water Pollution and Prevention Act was enacted by Government of India to regulate and prevent pollution?

Score Obtained : 0.0

A) 1974
B) 1970
C) 1986
D) 1981

Q2785541 The acronym of SNR is

Score Obtained : 0.0

A) Sand to Noise Ratio
B) Sand to Needle Ratio
C) Signal to Noise Ratio
D) Specimen to Noise Ratio

Q2785543 Which of the following device measures noise pollution?

Score Obtained : 0.0

A) Altimeter
B) Anemometer
C) Decibel meter
D) Rotameter

Q2786650 Mischmetal contains

Score Obtained : 0.0

A) Fe + Mn + Co
B) Fe + C + Al

C) Fe + Cr + Mn

D) Fe + Ce

Q2786483 Which type of corrosion will occur when a piece of carbon steel is exposed to salt water?

Score Obtained : 0.0

A) Filiform corrosion

B) Erosion corrosion

C) Crevice corrosion

D) Pitting corrosion

Q2786607 Calgon causes the softening of hard water by

Score Obtained : -0.25

A) sequestration of Cl^- and SO_4^{2-}

B) precipitating the Ca^{2+} and Mg^{2+} ions as phosphates

C) precipitating the Ca^{2+} and Mg^{2+} ions as sulphates

D) sequestration of Ca^{2+} and Mg^{2+} ion

Q2780867 Four metals A, B, C and D have SRP values of $-2.76\ V, -1.66\ V, -0.76\ V$ and $+0.80\ V$ respectively, the most reducing metal among these is

Score Obtained : 0.0

A) D

B) C

C) A

D) B

Q2780866 The standard reduction electrode potentials of copper and magnesium electrodes are + 0.34 and $-2.34\ V$ respectively. The emf of the cell is

Score Obtained : -0.25

A) $-2.68\ V$

B) $+2.68\ V$

C) $7.0\ V$

D) $-2.0\ V$

Q2786431 Condition required for a function f(x) to be strictly increasing

Score Obtained : 1.0

A) $f'(x) = 0$

B) $f'(x) < 0$

C) $f'(x) > 0$

D) $f''(x) > 0$

Q2781111 If $y = x \tan y$ then $\frac{dy}{dx}$ is

Score Obtained : -0.25

A) $\frac{\tan y}{x - x^2 - y^2}$

B) None

C) $\frac{\tan y}{x-y}$

D) $\frac{y}{x-x^2-y^2}$

Q2780958 The equation of the line which passes through the point (1 , -6) and whose product of the intercepts on the coordinate axes is one, is

Score Obtained : 1.0

A) 4x+y-2=0
B) 9x-10y=75
C) 9x+y =3
D) 2x-3y=25

Q2780957 The equation of the line perpendicular to the line joining (3,-5), (5,7) and passing through (2,-3) is

Score Obtained : 1.0

A) 5x+3y+5=0
B) 6x-y+16=0
C) x+6y+16=0
D) 2x+3y=1

Q2781144 The constant term in the characteristic polynomial of the matrix $A=\begin{bmatrix}2 & -3\\ 4 & 1\end{bmatrix}$ is

Score Obtained : 0.0

A) – 10
B) – 14
C) 10
D) 14

Q2781112 If $y=\sin^{-1}x+\cos^{-1}x, \frac{dy}{dx}$ at $x=0$ is

Score Obtained : 1.0

A) $\frac{2}{\sqrt{1-x^2}}$
B) 2
C) 4
D) 0

Q2786415 What can be atmost the numerator of a partial fraction with linear factor in denominator?

Score Obtained : 1.0

A) constant or linear factor
B) linear factor
C) quadratic factor
D) constant

Q2781100 $\lim_{x\to 0}\frac{\tan x-\sin x}{x^3}=$

Score Obtained : 0.0

A) 0

B) $\frac{1}{2}$

C) $\frac{1}{3}$

D) 1

Q2786422 Number of partial fractions in the resolving of $\frac{2x+11}{x^2-7x+10}$

Score Obtained : 1.0

A) 4

B) 2

C) 1

D) 3

Q2780936 If $\tan\theta = \frac{p}{q}$, then $\frac{p\sin\theta - q\cos\theta}{p\sin\theta + q\cos\theta} =$

Score Obtained : 1.0

A) $\frac{p^2-q^2}{p^2+q^2}$

B) $(p^2+q^2)(p^2-q^2)$

C) $\frac{p^2+q^2}{p^2}$

D) $\frac{p^2+q^2}{p^2-q^2}$

Q2786414 Term with lowest degree in partial fractions

Score Obtained : 1.0

A) Denominator

B) Numerator

C) Vinculum

D) Not defined

Q2780931 The value of $\cos^2 48^0 - \sin^2 12^0$ is

Score Obtained : 0.0

A) $\frac{\sqrt{5}+1}{2\sqrt{2}}$

B) $\frac{\sqrt{5}+1}{5}$

C) $\frac{\sqrt{5}+1}{8}$

D) $\frac{\sqrt{5}-1}{8}$

Q2780913 What is the coefficient of x^{50} after simplification and collecting the like terms in the expansion of $(1+x)^{1000} + x(1+x)^{999} \ldots\ldots\ldots + x^{1000}$

Score Obtained : -0.25

A) $^{1000}C_{50}$

B) $^{1001}C_{50}$

C) $^{1000}C_{51}$

D) $^{1001}C_{51}$

Q2781077 If $|\vec{a}|=11, |\vec{b}|=23, and\ |\vec{a}+\vec{b}|=30,$ then $|\vec{a}-\vec{b}|$ =

Score Obtained : 0.0

A) 20

B) 10

C) 25

D) 15

Q2780917 What is the coefficient of x^{40} in the expansion of $(1+2x+x^2)^{27}$?

Score Obtained : 0.0

A) $^{51}C_{40}$

B) $^{54}C_{40}$

C) $^{65}C_{40}$

D) $^{50}C_{40}$

Q2780969 If **l** = $3\vec{i}-\vec{j}+2\vec{k}$, **m** = $\vec{i}+\vec{j}+2\vec{k}$ and **n** = $2\vec{i}+2\vec{j}+2\vec{k}$ are three vectors, then what is the value of λ such that **n** is perpendicular to λ**l** + **m** ?

Score Obtained : 0.0

A) -2

B) 2

C) 1

D) -1

Q2786399 Notation of logarithm of N to the base a

Score Obtained : 1.0

A) $\log_e N$

B) $\log_a N$

C) $\log_N a$

D) $\log_e a$

Q2781154 In the Arithmetic Progression 1, 2, 3, 4, …….. , the sum upto 10 terms is

Score Obtained : 1.0

A) 50

B) 5050

C) 55

D) 505

Q2781155 What is the value of sum of the first 100 natural numbers?

Score Obtained : 1.0

A) 3030

B) 2020

C) 1010

D) 5050

Q2780953 If (1,2) , (4,y) , (x,6) and (3,5) are the vertices of a parallelogram taken in order, then the values of x and y are

Score Obtained : 0.0

A) 2 and 4 respectively
B) 3 and 6 respectively
C) 6 and 3 respectively
D) -3 and 5 respectively

Q2780945 If the vertices of a triangle are (1, k), (4, -3), (-9, 7) and its area is 15 sq units, find the value of k?

Score Obtained : 0.0

A) 5
B) -4
C) -3
D) 2

Q2781101 $\lim_{x\to 0}\frac{sin^{-1}(x-2)}{x^2-4}$ is equal to?

Score Obtained : 1.0

A) 1/2
B) 2
C) 0
D) 1

Q2780930 If $\sin\theta + \cos\theta = a$ then $\sin^4\theta + \cos^4\theta =$

Score Obtained : 1.0

A) $1+\frac{1}{2}\left(a^2-1\right)^2$
B) $\frac{1}{2}\left(a^2+1\right)^2$
C) $1-\frac{1}{2}\left(a^2-1\right)^2$
D) $\frac{1}{2}\left(a^2-1\right)^2$

Q2780967 A straight line makes an angle of 30°, 45° and 60° with the positive direction of X-axis, Y-axis and Z-axis respectively. What are the direction cosines of the straight line?

Score Obtained : 1.0

A) $(\frac{\sqrt{3}}{2},\frac{1}{\sqrt{2}},\frac{1}{2})$
B) $(\frac{1}{\sqrt{2}},\frac{\sqrt{3}}{2},1)$
C) $(\frac{1}{2},\frac{1}{\sqrt{2}},\frac{\sqrt{3}}{2})$
D) $(0,\frac{1}{\sqrt{2}},\frac{1}{2})$

Q2786438 Maximum value of the function $41+24x-18x^2$

Score Obtained : 1.0

A) 40
B) 45
C) 42
D) 49

Q2786403 $\log_{10} 2 + \log_{10} 5$

Score Obtained : 1.0

A) 4
B) 2
C) 1
D) 5

Q2786402 Logarithm of 2025 to the base $3\sqrt{5}$

Score Obtained : 1.0

A) 5
B) 4
C) 1
D) 2

Q2781110 If $\tan^{-1}\left(\frac{y}{x}\right)-\frac{1}{2}\log\left(x^2+y^2\right)=0$ then $\frac{dy}{dx}$ is

Score Obtained : -0.25

A) $\frac{x-y}{x+y}$
B) $\frac{x+y}{x-y}$
C) $(x+y)(x-y)$
D) 1

Q2781102 If $y = xe^{2y}$, then find dy/dx?

Score Obtained : 1.0

A) x/(y(1-2y))
B) y/(x(1-2x))
C) x/(y(1-2x))
D) y/(x(1-2y))

Q2781104 Find the derivative of √2x + 2√x - 1/√x?

Score Obtained : -0.25

A) √2-1/√x(1-1/2x)
B) √2+1/√x(1+1/2x)
C) √2+1/√x(1-1/2x)
D) √2-1/√x(1+1/2x)

Q2786430 Slope of tangent to the curve y=f(x)

Score Obtained : 1.0

A) $\frac{dy}{dz}$

B) $\frac{dx}{dy}$

C) $\frac{dy}{dx}$

D) $\frac{dx}{dz}$

Q2780916 The coefficient of x^7 in the expansion of $(1+x)^{21}+(1+x)^{22}+\cdots\ldots\ldots\ldots+(1+x)^{30}$ is

Score Obtained : 0.0

A) $^{9}C_{5}$

B) $^{51}C_{5}$

C) $^{30}C_{7} + {}^{20}C_{7}$

D) $^{31}C_{8} - {}^{21}C_{8}$

Q2780902 The co-efficient of x^5 in the expansion of $(1+x^2)^5(1+x)^4$ is

Score Obtained : 1.0

A) 50

B) 30

C) 60

D) 40

Q2781129 If $A=\begin{bmatrix} i & 0 \\ 0 & i \end{bmatrix}$ then A^{4n}, $n\in N$, equals

Score Obtained : 1.0

A) $\begin{bmatrix} 0 & i \\ i & 0 \end{bmatrix}$

B) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

C) $\begin{bmatrix} i & 0 \\ 0 & i \end{bmatrix}$

D) $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

Q2781130 If $A=\begin{bmatrix} 4 & -2 \\ -1 & 3 \end{bmatrix}$, then A.adj A =

Score Obtained : 1.0

A) $\begin{bmatrix} 10 & 0 \\ 0 & 10 \end{bmatrix}$

B) $\begin{bmatrix} 10 & 10 \\ 10 & 10 \end{bmatrix}$

C) $\begin{bmatrix} 0 & 10 \\ 10 & 0 \end{bmatrix}$

D) $\begin{bmatrix} 1 & 10 \\ 10 & 1 \end{bmatrix}$

Q2781113 $y=\tanh^{-1}\left(\tan\frac{x}{2}\right)$ then $\frac{dy}{dx}$ is

Score Obtained : 0.0

A) $\frac{\sec^2\frac{x}{2}}{2\left(1-\tan^2\frac{x}{2}\right)}$

B) $\frac{\sec^2\frac{x}{2}}{1-\tan^2\frac{x}{2}}$

C) $\frac{1}{2}$

D) $\sec x$

Q2780914 In the binomial expansion of $(1+x)^n$, the coefficients of the 5th, 6th and 7th terms are in A.P. What is one of the values of n?

Score Obtained : 0.0

A) 6

B) 2

C) 9

D) 7

Q2786426 Constant associated with linear factor x+7 , while resolving $\frac{2x+1}{x^2+5x-14}$

Score Obtained : 1.0

A) $\frac{13}{9}$

B) 13

C) $\frac{5}{9}$

D) 9

Q2781156 In an A.P. if the n^{th} term is t_n = 5n-1, then what is the value of the common difference?

Score Obtained : 1.0

A) 5

B) 3

C) 4

D) 7

Q2781157 Which term of the arithmetic progression 5, 2, -1, ... is -22?

Score Obtained : 1.0

A) 6^{th}

B) 12^{th}

C) 10^{th}

D) 5^{th}

Q2780959 If P(a , b) , Q(a+3 , b+3) , R(a-1 , b+7) are the three vertices of a parallelogram PQRS in the same ordered manner, then the coordinates of S is

Score Obtained : 0.0

A) (a-2 , b-3)

B) (a-4 , b+4)

C) (a+1 , b+3)

D) (a+4 , b-3)

Q2780897 The multiplicative inverse of the matrix A = $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ is

Score Obtained : -0.25

A) $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$

B) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

C) $\begin{bmatrix} 0 & 1 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{bmatrix}$

D) $\begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$

Q2780929 If $\tan 25^0 = x$, then $\frac{\tan 155^0 - \tan 115^0}{1 + \tan 155^0 . \tan 115^0} =$

Score Obtained : 0.0

A) $\frac{1 + x^2}{2x}$

B) $\frac{1 - x^2}{1 + x^2}$

C) $\frac{1 - x^2}{2x}$

D) $\frac{1 + x^2}{1 - x^2}$

Q2781082 The unit vector in the direction of 2i + 3j+ k.

Score Obtained : 1.0

A) $\sqrt{14}$

B) $\sqrt{24}$

C) $\sqrt{18}$

D) $\sqrt{12}$

Q2781081 Volume is a

Score Obtained : -0.25

A) Scalar quantity

B) Base quantity

C) Derived quantity

D) Vector quantity

Q2786442 Which of the following makes the function f(x)=$|x|$ defined in the interval [-2,2] unfit for Rolle's theorem application?

Score Obtained : 0.0

A) derivative at x=-1 doesn't exist

B) derivative at x=1 doesn't exist

C) function value at 2 and -2 are not same

D) derivative at x=0 doesn't exist

Q2786398 Logarithm of unity to any non-zero base

Score Obtained : 1.0

A) 1

B) 2

C) 10

D) 0

Q2781132 If A is a 3x3 matrix, then |3A| =

Score Obtained : 1.0

A) 9|A|

B) 27|A|

C) $|A|^3$

D) 3|A|

Q2781120 The derivative of $\tan^{-1}\left(\frac{2x\sqrt{1-x^2}}{1-2x^2}\right)$ w.r.t $\sec^{-1}\left(\frac{1}{2x^2-1}\right)$ at $x=\frac{1}{2}$ is

Score Obtained : 1.0

A) -1

B) -2

C) 1

D) 2

Q2781103 Differentiate sin(sin2x)

Score Obtained : 1.0

A) 2cos2x.cos(sin2x)

B) 2cos2x.cos2x

C) cos2x.cos(sin2x)

D) 2cos2x.sin2x
