Examination: **P.G. Dip Green Energy Technology**

Section 1 - Section 1

Question No.1 4.00

Bookmark ☐

Choose the best synonym of the italicized word. The prisoners of war signed the document under *coercion*.
- ○ supervision
- ○ compulsion
- ○ confusion
- ○ security

Question No.2 4.00

Bookmark ☐

The following is true for the following partial differential equation used in nonlinear mechanics known as the Korteweg-de Vries equation
- ○ linear; 1st order
- ○ linear; 3rd order
- ○ nonlinear; 1st order
- ○ nonlinear; 3rd order

Question No.3 4.00

Bookmark ☐

The efficiency of a Carnot engine working between 0^oC and 100^oC
- ○ 0.5
- ○ 1
- ○ 100/373
- ○ 100/273

Question No.4 4.00

Bookmark ☐

If three 18μF capacitors are connected in series, the net capacitance is
- ○ 18μF
- ○ 54μF
- ○ 0μF
- ○ 6μF

Question No.5 4.00

Bookmark ☐

Beta particles are emitted
- ○ Due to reversion of the excited nucleus to the ground state.
- ○ Due to conversion of neutrons into protons in the nucleus
- ○ Due to conversion of protons into neutrons
- ○ When outermost orbital electron leave the atom

Question No.6 4.00

Bookmark ☐

Which is the most economical section for a beam
- ○ I- Section
- ○ Circular
- ○ Square
- ○ Rectangular

Question No.7 4.00

Bookmark ☐

The frequency of damped oscillations as compared to frequency of undamped vibrations with viscous damping, is
- ○ Same
- ○ More
- ○ Less
- ○ Zero

Question No.8 4.00

Bookmark ☐

In allene, hybridization of the central and terminal carbons, respectively, are
- ○ sp and sp^2
- ○ sp^2 and sp^3
- ○ sp and sp^3
- ○ sp^2 and sp^2

Question No.9 4.00

Bookmark ☐

A field line and an equipotential surface are
- ○ Inclined at 210°
- ○ Always parallel
- ○ Always at 90°
- ○ Inclined at 30°

Question No.10 4.00

Bookmark ☐

The angular momentum of the electron in the hydrogen atom can be
- ○ h/π

○ h/4π
○ 2h
○ 3h

Question No.11	4.00
	Bookmark ☐

Which one of the following gives the force required to accelerate a car of mass 2000 kg from rest to 30 m/s in 12 s, if the frictional force between the tyres and the ground is 0.2 N/kg?

○ 5000 N
○ 4600 N
○ 400 N
○ 5400 N

Question No.12	4.00
	Bookmark ☐

The following are the example for mobile elements

○ Cu, Mg
○ Fe, Ca
○ Mn, Mo
○ Bo, S

Question No.13	4.00
	Bookmark ☐

Proteins specific to sugars are called

○ Lectin
○ Myoglobin
○ Pectin
○ Chitin

Question No.14	4.00
	Bookmark ☐

According to MO theory, for the atomic species 'C_2'

○ bond order is two and it is diamagnetic
○ bond order is two and it is paramagnetic
○ bond order is zero and it is diamagnetic
○ bond order is zero and it is paramagnetic

Question No.15	4.00
	Bookmark ☐

A semiconductor is known to have an electron concentration of 8×10^{19} m^{-3} and a hole concentration of 5×10^{18} m^{-3} (electron mobility = 2.0 and hole mobility = 0.01). The resistivity of the semiconductor is

○ $0.256\Omega m$
○ $256\Omega m$
○ $2.56\Omega m$
○ $25.6\Omega m$

Question No.16	4.00
	Bookmark ☐

Which is NOT required for "DNA replication?"

○ Polymerase
○ Kinase
○ Primase
○ Helicase

Question No.17	4.00
	Bookmark ☐

Which of the following is NOT true about condensin protein complex?

○ binds two sister chromatids together
○ binds a single chromatid at multiple spots
○ twists the chromatin into coils and loops
○ it is an elongated complex of several proteins that binds and encircles DNA

Question No.18	4.00
	Bookmark ☐

The differential equation $2\dfrac{dy}{dx} + x^2 y = 2x + 3, \; y(0) = 5$ is

○ Linear with fixed constants
○ Linear

○ Nonlinear
○ Undeterminable to be linear or nonlinear

Question No.19	4.00

Bookmark ☐

Let A be a Hermitian matrix. Then, which of the following statements is false?

○ If $A^3 = I$, then $A = I$.

○ The diagonal entries of A are all real.

○ There exists a unitary U such that U AU is a diagonal matrix.

○ If $A^2 = I$, then $A = I$.

Question No.20	4.00

Bookmark ☐

In a molecule of chlorine trifluoride, CIF3 bond angle is

○ 109.5^o

○ 107.5^o

○ 78.5^o

○ 87.5^o

Question No.21	4.00

Bookmark ☐

Which of the following amino acid is likely to destabilise an alpha helix?

○ Histidine
○ Glycine
○ Proline
○ Leucine

Question No.22	4.00

Bookmark ☐

If obtained solution has same number of constants as the order of the differential equation then the solution of the differential equation is

○ Singular solution
○ General solution
○ Integrating factor
○ Particular solution

Question No.23	4.00

Bookmark ☐

If A+B means A is daughter of B,
A-B means A is husband of B
A × B means A is brother of B

From the statement P – Q + R × S, how is Q related to S?

○ Niece
○ Sister
○ Mother
○ None of these

Question No.24	4.00

Bookmark ☐

Let y= a cos4x + b sin 4x is solution of a differential equation then its order must be.

○ Two
○ One
○ Three
○ Any Positive Number Could Be

Question No.25	4.00

Bookmark ☐

In a transistor _____
○ IE = IC + IB
○ IB = IC + IE
○ IE = IC - IB
○ IC = IE + IB

Question No.26	4.00

Bookmark ☐

Two weights are suspended from a string thrown over a light frictionless pulley. The mass of one weight is 0,200 kg. If a heavy weight is attached to its other end, the tension in the string is

○ 0.600 kgf
○ Zero
○ 0.400 kgf
○ 0.200 kgf

Question No.27   4.00

Bookmark ☐

If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is

○ −1.7
○ −1.5
○ −4
○ −1.2

Question No.28   4.00

Bookmark ☐

○ 9
○ 10
○ 12
○ 11

Question No.29   4.00

Bookmark ☐

The unit of capacitance is

○ Henry / Wb
○ Coulombs / Volt
○ Volts/ Coulomb
○ Ohms

Question No.30   4.00

Bookmark ☐

The carbon-14 activity of an old wood sample is found to be 14.2 disintegrations $min^{-1}g^{-1}$. Calculate age of oldwood sample, if for a fresh wood sample carbon-14 activity is 15.3 disintegrations $min^{-1}g^{-1}$($t_{1/2}$ carbon-14 is 5730 years), is:

○ 877
○ 4000
○ 5000
○ 617

Question No.31   4.00

Bookmark ☐

Choose the best antonym of the italicized word.
Many snakes are actually *innocuous*.

○ poisonous
○ harmful
○ deadly
○ ferocious

Question No.32   4.00

Bookmark ☐

If 5 men or 8 boys can do a work in 84 days. In how many days can 10 men and 5 boys can do the same work?

○ 35
○ 28
○ 25
○ 32

Question No.33   4.00

Bookmark ☐

The ratio of reverse resistance and forward resistance of a germanium crystal diode is about

○ 100:1
○ 1:1
○ 40,000:1
○ 1000:1

Question No.34   4.00

Bookmark ☐

Set of (x,y) ordered pair that can satisfy equation is called

○ solution set
○ order set
○ variable set
○ pair set

Question No.35   4.00

Bookmark ☐

If A is the amplitude of a wave from a point source at a distance R from the source,

○ $A \alpha 1/R^2$

○ $A \alpha 1/R$

○ A is independent of R

○ $A \alpha 1/\sqrt{R}$

Question No.36   4.00

Bookmark ☐

If in a certain language, GRASP is coded as BMVNK, which word would be coded as CRANE?

○ BQZMD

○ XMVIZ

○ HWFSJ

○ FUDQH

Question No.37   4.00

Bookmark ☐

The geometries of $Ni(CO)_4$ and $[NiCl_4]^{2-}$, respectively, are

○ Square planar and tetrahedral

○ Tetrahedral and tetrahedral

○ Tetrahedral and square planar

○ Square planar and square planar

Question No.38   4.00

Bookmark ☐

Which among the following is NOT an omega-3 fatty acid?

○ Alpha-linolenic acid

○ Docosahexaenoic acid

○ Eicosapentaenoic acid

○ Linoleic acid

Question No.39   4.00

Bookmark ☐

A dielectric material must be

○ Resistor

○ Semi conductor

○ Insulator

○ Good Conductor

Question No.40   4.00

Bookmark ☐

Choose the correct meaning of the italicized idiom.
Those who work by *fits and start* seldom show good results.

○ Regularly

○ Rarely

○ Disinterestedly

○ Irregularly

Question No.41   4.00

Bookmark ☐

These boys need some new books, _____?

○ is it?

○ isn't it?

○ do they?

○ don't they?

Question No.42   4.00

Bookmark ☐

A two digit number is three times the sum of its digits. If 45 is added to it, the digits are reversed. The number is

○ 32

○ 35

○ 27

○ 31

Question No.43   4.00

Bookmark ☐

As per the kinetic theory of ideal gases, which of the following statements is NOT correct?

○ Particles are in a Brownian motion between collisions

○ Particles exert same force per unit area on all sides of the container

○ Gas molecules have mass but no volume

○ During the collision, the system does not lose energy

Question No.44   4.00

Bookmark ☐

"Silent spring" written by Rachel Carson deals with

○ Excessive use of pesticides

○ Deforestation

○ Air pollution

○ Water pollution

Question No.45   4.00

Bookmark ☐

Which of the following equations are solutions to the partial differential equation?

$$\frac{\partial^2 u}{\partial x^2} = 9 \frac{\partial^2 u}{\partial y^2}$$

○ sin (3x - 3y)

○ cos (3x - y)

○ x² + y²

○ $e^{-3\pi x} \sin(\pi y)$

Question No.46   4.00

Bookmark ☐

Study the following information carefully and answer the question below it:

Aasha, Bhuvnesh,Charan, Danesh, Ekta, Farhan, Ganesh and Himesh are sitting around a circle, facing the centre. Aasha sits fourth to the right of Himesh while second to the left of Farhan. Charan is not the neighbour of Farhan and Bhuvnesh. Danesh sits third to the right of Charan. Himesh never sits next to Ganesh.

Who among the following sits between Ganesh and Danesh?

○ Bhuvnesh

○ Ekta

○ Aasha

○ Charan

Question No.47   4.00

Bookmark ☐

In a silicon transistor α_{dc} = 100, V_{CC} = 30V, R_C = 1.5 kΩ. The saturation collector current of the transistor is

○ 30mA

○ 20mA

○ 10mA

○ 100mA

Question No.48   4.00

Bookmark ☐

Since the _____ of the motor car, road accidents have increased dramatically.

○ inception

○ advent

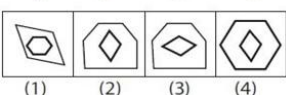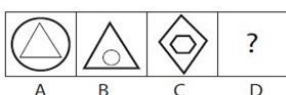○ inauguration

○ initiation

Question No.49   4.00

Bookmark ☐

In Simpson's (1/3) rd rule the number of intervals is _____.

○ Odd

○ Even

○ multiple of 6

○ multiple of 3

Question No.50   4.00

Bookmark ☐

○ 1

- ○ 2
- ○ 3
- ○ 4

Question No.51   4.00

Bookmark ☐

In a single-component condensed system, if degree of freedom is zero, maximum number of phases that can co-exist_____ .
- ○ 1
- ○ 2
- ○ 0
- ○ 3

Question No.52   4.00

Bookmark ☐

Which among the following is a C4 plant?
- ○ Paddy
- ○ Sugarcane
- ○ Red gram
- ○ Wheat

Question No.53   4.00

Bookmark ☐

Correct sequence flow of reaction in bioethanol production
- ○ Distillation- Enzyme hydrolysis- Fermentation- - bioethanol
- ○ Enzyme hydrolysis- Fermentation-distillation- bioethanol
- ○ Enzyme hydrolysis- distillation- Fermentation- bioethanol
- ○ Fermentation- Enzyme hydrolysis- distillation- bioethanol

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Question No.54   4.00

Bookmark ☐

Which of the following is an "even" function of t?

- ○ $t^3 + 6$
- ○ t^2
- ○ $t^2 - 4t$
- ○ $\operatorname{Sin}(2t) + 3t$

Question No.55   4.00

Bookmark ☐

A solution to a boundary value problem which satisfies boundary condition is a solution to the
- ○ Integral equation
- ○ Differential equation
- ○ logical equation
- ○ Maxwell's equation

Question No.56   4.00

Bookmark ☐

Iodinevalue of lipids is a measure of
- ○ Degree of polysaturation of lipids
- ○ Degree of unsaturation of lipids
- ○ Degree of saturation of lipids
- ○ Degree of monosaturation of lipids

Question No.57   4.00

Bookmark ☐

A battery supplies 150W and 196W power to two resistors of 6Ω and 4Ω when they are connected separately to it.

The internal resistance of the battery is
- ○ 0.5Ω
- ○ 2Ω
- ○ 1Ω
- ○ 2.5Ω

Question No.58   4.00

Bookmark ☐

Among the halides NCl_3 (A), PCl_3 (B) and $AsCl_3$, those which produce two different acids
- ○ A and C
- ○ B and C
- ○ A,B and C
- ○ A and B

Question No.59   4.00

Bookmark ☐

In mitochondria, oxidation of one molecule of NADH results in formation of
- ○ Four Molecules of ATP
- ○ Two molecules of ATP
- ○ One molecule of ATP
- ○ Three molecules of ATP

Question No.60   4.00

Bookmark ☐

The latent heat of vaporisation of water is 2,240 J. If the work done in the process of vaporisation of 1g is 168 J, then the increase in internal energy is
- ○ 2072 J
- ○ 1904 J
- ○ 2408 J
- ○ 2240 J

Question No.61   4.00

Bookmark ☐

The excess of pressure inside a bubble in a liquid is

- ○ 2T/r
- ○ T/r
- ○ 4T/r
- ○ 3T/r

Question No.62   4.00

Bookmark ☐

The rate constant of unimolecular reaction was 2.66×10^{-3} s^{-1} and 2.2×10^{-1} s^{-1} at T= 120 K and 360 K respectively. The rate constant (in s^{-1}) at 240 K would be:
- ○ 1.8×10^{-3}
- ○ 4.8×10^{-2}
- ○ 2.4×10^{-2}
- ○ 2.4×10^{-1}

Question No.63   4.00

Bookmark ☐

" A total electric flux through any closed surface surrounding charges is equal to the amount of charge enclosed" The above statement is associated with
- ○ Maxwell's second law
- ○ Maxwell's first law
- ○ Gauss's law
- ○ Coulomb's square law

Question No.64   4.00

Bookmark ☐

The vapour of a pure substance, when cooled under a pressure less than its triple-point pressure
- ○ Remains unchanged
- ○ Liquefies first and then solidifies
- ○ Solidifies directly
- ○ Liquefies

Question No.65   4.00

Bookmark ☐

All the Eigen value of an orthogonal matrix are of unit modulus.
- ○ true
- ○ false
- ○ All are false.
- ○ The Eigen values of an orthogonal matrix may be any real matrix.

Question No.66   4.00

Bookmark ☐

The classical experiments of variation in plants by Gregor Mendel was performed in
- ○ Arabidopsis
- ○ Rice
- ○ Maize
- ○ Pea

Question No.67   4.00

Bookmark ☐

As the temperature of transistor goes up, the base-emitter resistance _____
- ○ First increases and then decreases
- ○ Remains Same
- ○ Decreases
- ○ Increases

Question No.68   4.00

Bookmark ☐

When potassium is added to water, it is seen that the lower region becomes warm first and becomes less dense. It then moves up and the more dense cold water comes down and the process goes on. What is the process taking place?
- ○ Purification

○ Purification
○ Convection
○ Radiation
○ Conduction

Question No.69   4.00

Analysis of boundary value problem involves functions of a differential operator. These functions are
○ Eigen function
○ algebraic function
○ symmetric function
○ logical function

Question No.70   4.00

In a transformer the energy is conveyed from primary to secondary
○ Both air and cooling coil
○ Through air
○ By the flux
○ Through cooling coil

Question No.71   4.00

A square matrix [A] is lower triangular if

○ $a_{ij} \neq 0, i > j$

○ $a_{ij} \neq 0, j > i$

○ $a_{ij} = 0, j > i$

○ $a_{ij} = 0, i > j$

Question No.72   4.00

For a face centered cubic lattice, the Miller indices for the first Bragg's peak (smallest Bragg angle) are
○ 1 1 0
○ 0 0 2
○ 0 0 1
○ 1 1 1

Question No.73   4.00

Choose the correct meaning of the italicized idiom.
You cannot throw *dust into my eyes.*
○ Abuse me
○ Cheat me
○ Hurt me
○ Terrify me

Question No.74   4.00

How many atoms are there in an element packed in a FCC structure
○ 83
○ 2
○ 1
○ 4

Question No.75   4.00

A differential equation is considered to be ordinary if it has
○ One independent variable
○ More than one independent variable
○ One dependent variable
○ More than one dependent variable

Question No.76   4.00

The dimensions of capacitance are
○ $M^{-1}L^{-1}T^2Q^2$
○ $M^{-2}L^{-2}T^2Q^2$
○ $M^{-1}L^{-2}T^2Q^1$

○ M⁻¹L⁻²T²Q²

Question No.77   4.00

The species ^{19}Ne and ^{14}C emit a positron and β- particle respectively. The resulting species formed are respectively-

○ ^{19}Na and ^{14}N

○ ^{19}Na and ^{14}B

○ ^{19}F and ^{14}N

○ ^{19}F and ^{14}B

Question No.78   4.00

A cantilever of length l is carrying a uniformly distributed load of w per unit run over the whole span. The deflection at the free end is given as

○ $\dfrac{wl^2}{4EI}$

○ $\dfrac{wl^4}{16EI}$

○ $\dfrac{wl^4}{8EI}$

○ $\dfrac{wl^3}{4EI}$

Question No.79   4.00

The reverse current in a diode is of the order of

○ Amps

○ µ A

○ kA

○ mA

Question No.80   4.00

Choose the missing term : AZ, GT, MN, ?, YB

○ SX

○ KE

○ SH

○ TS

Question No.81   4.00

Based on the information given answer the following question.
1. In a family of six persons, there are people from three generations. Each has separate professions and they like different colours. There are two couples.
2. Shyam is an Engineer and his wife is not a doctor and she does not like Red colour.
3. Chartered Accountant likes green colour and his wife is a teacher.
4. Manisha is the mother-in-law of Sunita and she likes orange colour.
5. Vimal is the grand father of Tarun and tarun is the Principal and likes black colour.
6. Nyna is the grand daughter of Manisha and she likes blue colour. Nyna's Mother likes white colour.

Which of the following is the correct pair of two couples?

○ Shyam-Manisha, Vimal-Sunita

○ Cannot be determined

○ Shyam-Sunita, Vimal-Manisha

○ Tarun-Nyna, Shyam-Sunita

Question No.82   4.00

The path of a magnetic flux in a transformer should have

○ Low resistance

○ High reluctance

○ Low reluctance

○ High resistance

Question No.83   4.00

Statements: All tools are books, Some books are pens.
Conclusion:
I. Some tools are pen
II. Some pens are books

○ If either I or II follows

○ If only conclusion II follows

○ If only conclusion I follows

○ If neither I nor II follows

Question No.84   4.00

Study the following information carefully and answer the question below it

(i) There is a group of five persons- A, B, C, D and E

(ii) One of them is manual scavenger, one is sweeper, one is watchman, one is human scarecrow and one is grave-digger
(iii) Three of them – A, C and grave-digger prefer tea to coffee and two of them – B and the watchman prefer coffee to tea
(iv) The human scarecrow and D and A are friends to one another but two of these prefer coffee to tea.
(v) The manual scavenger is C's brother

Who is a manual scavenger?
- ○ D
- ○ B

- ○ C
- ○ A

Question No.85   4.00

Bookmark ☐

A small loudspeaker radiates 5W of power and the intensity is 1 Wm^{-2} at a distance of 2m from the speaker. If the power of the speakers is doubled, the intensity in Wm^{-2} at a distance of 4m from the speaker is
- ○ 2
- ○ 0.5
- ○ 1
- ○ 4

Question No.86   4.00

Bookmark ☐

Which among the following amino acid residue is most likely getting phosphorylated in prokaryotes?
- ○ Threonine
- ○ Histidine
- ○ Serine
- ○ Tyrosine

Question No.87   4.00

Bookmark ☐

Moment of inertia of an object does not depend upon
- ○ Angular velocity
- ○ Mass of distribution
- ○ Mass of object
- ○ Axis of rotation

Question No.88   4.00

Bookmark ☐

Chelate effect is
- ○ independent of ring size
- ○ due to equal contribution of entropy and enthalpy change
- ○ predominantly due to entropy change
- ○ predominantly due to enthalpy change

Question No.89   4.00

Bookmark ☐

The decreasing order of dipole moment of molecules is
- ○ $NH_3 > NF_3 > H_2O$
- ○ $H_2O > NF_3 > NH_3$
- ○ $H_2O > NH_3 > NF_3 >$
- ○ $NF_3 > NH_3 > H_2O$

Question No.90   4.00

Bookmark ☐

A metal crystallizes in fcc structure with a unit cell side of 500 pm. If the density of the crystal is 1.33 g/cc, the molar mass of the metal is
- ○ 25
- ○ 24
- ○ 23
- ○ 26

Question No.91   4.00

Bookmark ☐

Transplastomics
- ○ Provides exceptionally low yields of protein products
- ○ Produces genes that are released in pollen
- ○ Targets genes in the chloroplast
- ○ Targets genes in the mitochondria

Question No.92   4.00

Bookmark ☐

Which is an intensive property?
- ○ Mass
- ○ Weight
- ○ Refractive index

○ Refractive index
○ Volume

Question No.93 4.00

Which of the following biological macromolecules are structurally diverse in living world?
○ Nucleic acids
○ Proteins
○ Lipids
○ Carbohydrates

Question No.94 4.00

Statement: "A Car is required on rent"-An Advertisement
Assumptions:
I. All types of Vehicles are available on Rent
II. People will respond to the advertisements
○ If only assumption I is implicit
○ If neither I nor II is implicit
○ If only assumption II is implicit
○ If both I and II are implicit

Question No.95 4.00

In recent times, the number of cases of death by poisoning _____ sharply.
○ increased
○ have increased
○ had increased
○ has increased

Question No.96 4.00

A partial differential equation requires
○ Exactly one independent variable
○ More than one dependent variable
○ Two or more independent variables
○ Equal number of dependent and independent variables

Question No.97 4.00

Water use efficiency is minimum in
○ C3 plants
○ C4 plants
○ All higher plants
○ CAM plants

Question No.98 4.00

During tensile test, what does percentage elongation indicate
○ Fatigue Strength
○ Ductility
○ Malleability
○ Creep

Question No.99 4.00

The knee voltage of a crystal diode is approximately equal to
○ Barrier Potential
○ Applied Voltage
○ Forward Voltage
○ Breakdown Voltage

Question No.100 4.00

Choose the best antonym of the italicized word.
There are four chapters that are *extraneous* to the structure of the book.
○ needful
○ relevant
○ important
○ integral

Sr No.	PG DIP Green Energy Technology
1	Find the missing term in the following series: 3,15,?,63,99,143…?
Alt1	27
Alt2	35
Alt3	45
Alt4	56

2	Choose word from the given options which bears the same relationship to the third word, as the first two bears: Horse : Jockey :: Car : ?
Alt1	Mechanic
Alt2	Chauffeur
Alt3	Steering
Alt4	Brake

3	Food is to Fad as Religion is to……?........
Alt1	Crucification
Alt2	Notion
Alt3	Superstition
Alt4	Mythology

4	Select the lettered pair that has the same relationship as the original pair of words: Fond: Doting
Alt1	Solicitous: Concern
Alt2	Verbose: Wordiness
Alt3	Flurry: Blizzard
Alt4	Magnificent: Grandiose

5	Which of the following is the same as Emancipate, Free, Release?
Alt1	Liberate
Alt2	Quit
Alt3	Pardon
Alt4	Ignore

6	Spot the defective segment from the following:
Alt1	I met one of the mountaineers
Alt2	that have returned
Alt3	to their base camp
Alt4	the last week

7	Choose the meaning of the idiom/phrase from among the options given: To call names
Alt1	to abuse
Alt2	to recall something
Alt3	to count the prisoners
Alt4	to take attendance

8	Our tour programme fell ------ because of inclement weather.
Alt1	through
Alt2	off
Alt3	out
Alt4	down

9	Choose the option closest in meaning to the given word: POIGNANT
Alt1	unbearable
Alt2	maximal
Alt3	pathetic
Alt4	sharp

10	Choose the antonymous option you consider the best: WANTON
Alt1	rational
Alt2	abstemious
Alt3	dearth
Alt4	deliberate

11	Six people K, L, M, N, O and P are sitting around a table as per the following conditions.　　i. N and O are opposite each other ii. K is to the right of M iii. L and K are opposite each other iv. N is to the left of P Who is to the left of L ?
Alt1	P
Alt2	M
Alt3	N
Alt4	O

12	Study the following table carefully to answer the questions that follow (15 to 17) :Total number of employees in different departments in an organisation and (of these) percentage of females and males Department Total number of employees Percentage of female employees Percentage of male employees IT 840 45 55 Accounts 220 35 65 Production 900 23 77 HR 360 65 35 Marketing 450 44 56 Customer Service 540 40 60 What is the total number of male employees in the IT and Customer Service departments put together?
Alt1	115
Alt2	786

Alt3	768
Alt4	85

13	Study the following table carefully to answer the questions that follow (15 to 17) :Total number of employees in different departments in an organisation and (of these) percentage of females and males
	Department Total number of employees Percentage of female employees Percentage of male employees
	IT 840 45 55
	Accounts 220 35 65
	Production 900 23 77
	HR 360 65 35
	Marketing 450 44 56
	Customer Service 540 40 60
	What is the total number of employees in all departments put together ?
Alt1	3260
Alt2	3310
Alt3	3140
Alt4	3020

14	Select the alternative that logically follows from the two given statements, but not from one statement alone:
	All Cats are dogs
	No dogs are rats
Alt1	All cats are rats
Alt2	Some cats are rats
Alt3	No cat is rat
Alt4	None of the above

15	In a certain code language, " When did you come" is written as 'ti na ki ja'. "Will you come again" is written as 'na pa sa ja' and "She will go" is written as 'pa da ra'. How is "again" written in that code language ?
Alt1	Na
Alt2	sa
Alt3	ja
Alt4	da

16	In each of the following questions some statements are followed by two conclusions (i) and (ii). Read the statements carefully and then decide which of the conclsions follow beyond a reasonable doubt. Mark your answer as
	Statement: The aspirants should apply through a proper channel for permission Conclusions: (i) Those who apply through proper channel will get permission
	(ii) Those who do not apply through proper channel will not get permission
Alt1	If only conclusion (i) follows

Alt2	If only conclusion (ii) follows
Alt3	If neither conclusion (i) nor (ii) follows
Alt4	If both the conclusions follow

17	The average height of 3 children is 115 cms. If the heights of 2 children are 117 cms. And 112 cms. Respectively, the height of the third child is
Alt1	112 cms.
Alt2	113 cms.
Alt3	115 cms.
Alt4	116 cms.

18	What is the 30% of 40% of 2/5th of 5000?
Alt1	500
Alt2	800
Alt3	240
Alt4	720

19	There are n persons in a room. Each one is shaking hand with the other . Ultimately there are 66 hand-shakes. Then n=
Alt1	11
Alt2	12
Alt3	16
Alt4	33

20	A problem is given to students 10 students choose option A ; 6 students choose option B ; 2 students choose option C; Gopal choose option D; 5 students did not answer. which option is correct if the teacher tells that One-Twelth of the class gave the correct answer.
Alt1	B
Alt2	A
Alt3	C
Alt4	D

21	Which one is used in industrial fermentation to produce beverages?
Alt1	Bacteria
Alt2	Yeast
Alt3	Microalgae
Alt4	Vitamins

22	Number of hydrogen and phosphodiester bonds found in this hypothetical DNA 5' AGCTCGTAGCTACGTGAC 3' strand?
Alt1	24 and 18
Alt2	46 and 34

Alt3	23 and 17
Alt4	48 and 36

23	Allergens are?
Alt1	Interferons
Alt2	Lectin compounds
Alt3	Non-parasitic antigens
Alt4	Fungal antigens

24	Cellobiose is
Alt1	Monosaccharide
Alt2	Disaccharide
Alt3	Polysaccharide
Alt4	Polymer of glucose and mannose

25	Glycolis is the _____ process
Alt1	Fermentive
Alt2	Aerobic
Alt3	Anaerobic
Alt4	Both A and B

26	Chlorophyll molecule contains _____ ion in its structure
Alt1	Mg3+
Alt2	Mg2+
Alt3	Ca2+
Alt4	Fe2+

27	Water use efficiency is minimum in
Alt1	CAM plants
Alt2	C3 plants
Alt3	C4 plants
Alt4	All higher plants

28	All amino acid except _____ are specified by more than one codon
Alt1	Arginine and Tryptophan
Alt2	Tryptophan and Methionine
Alt3	Methionone and Arginine
Alt4	Methionine and Threonine

29	The independent process of plant microbe interaction in Agrobacterium infection is
Alt1	Induction of Vir genes
Alt2	T-DNA integration
Alt3	Produc on of phenolics
Alt4	All the above

30	The molecule which has the highest percentage of ionic character among the following is
Alt1	HI

Alt2	HF
Alt3	HCl
Alt4	HBr

31	Dimerisation of cyclopentadiene is an example of
Alt1	Friedel–Crafts reaction
Alt2	Chain reaction
Alt3	Condensation Polymerisation
Alt4	Diels Alder reaction

32	Density of water is
Alt1	1 g/cm3
Alt2	10 g/cm3
Alt3	100 /cm3
Alt4	1000 g/cm3

33	Zeta potential is related to
Alt1	Galvanic corrosion
Alt2	Surface charge
Alt3	Electrophoretic effect
Alt4	Bio molecular reaction

34	Indicator used in redox titration is
Alt1	Eriochrome black T
Alt2	Methyl orange
Alt3	Phenolphthalein
Alt4	Methylene blue

35	Water is a good solvent of ionic salts because
Alt1	It has a high specific heat
Alt2	It has no colour
Alt3	It has a high dipole moment
Alt4	It has a high boiling point

36	The heat energy produced when the human body metabolises 1 gram of fat is
Alt1	30 KJ
Alt2	1 KJ
Alt3	39 KJ
Alt4	29 KJ

37	What are the number of moles of CO_2 which contains 16 g of oxygen?
Alt1	0.5 mole
Alt2	0.2 mole
Alt3	0.4 mole
Alt4	0.25 mole

38	The iron ore magnetite consists of

Alt1	Fe2O3
Alt2	Fe3OH4
Alt3	FeCO3
Alt4	3Fe2O3 & 3H2O

39	Steel is more elastic than Rubber because
Alt1	Its density is high
Alt2	It is a metal
Alt3	Ratio of stress to strain is more
Alt4	Ratio of stress to strain is less

40	Plants that grow in saline water are called
Alt1	Halophytes
Alt2	Hydrophytes
Alt3	Mesophytes
Alt4	Thallophytes

41	The inherited traits of an organism are controlled by
Alt1	RNA molecules
Alt2	Nucleotides
Alt3	DNA molecules
Alt4	Enzymes

42	If $x + y = k$, $x > 0$, $y > 0$, then xy is maximum when
Alt1	$x = ky$
Alt2	$kx = y$
Alt3	$x = y$
Alt4	None of these

43	The angle between any two diagonals of a cube is
Alt1	$\cos\theta = \sqrt{3}/2$
Alt2	$\cos\theta = 1/\sqrt{2}$
Alt3	$\cos\theta = 1/3$
Alt4	$\cos\theta = 1/\sqrt{6}$

44	Find the equation of the circle with centre (2, 0) and radius 10 units
Alt1	x2+y2-4x-96=0
Alt2	x2+y2-x-96=0
Alt3	x2+y2+4x-96=0
Alt4	x2+y2+4x+96=0

45	Radiocarbon dating technique is used to estimate the age of
Alt1	Rocks
Alt2	Monuments
Alt3	Soil
Alt4	Fossils

46	Eigen vector(s) of the matrix $$\begin{bmatrix} 0 & 0 & \alpha \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$
Alt1	$(0,0,\alpha)$
Alt2	$(\alpha,0,0)$
Alt3	$(0,0,1)$
Alt4	$(0,\alpha,0)$

47	What is the total number of positive integer solutions to the equation $(x1 + x2 + x3)(y1+ y2 + y3 + y4) = 15$?
Alt1	1
Alt2	2
Alt3	3
Alt4	4

48	The formula of the aluminium carbide is
Alt1	Al2C3
Alt2	Al3C4
Alt3	Al4C3
Alt4	AlC2

49	During which of the following major mass extinction events, over 95% of the marine species disappeared from the planet Earth?
Alt1	Ordovician
Alt2	Devonian
Alt3	Permian
Alt4	Triassic

50	Oil raise up the wick in a lamp. The principle involves
Alt1	The diffusion of oil through the wick
Alt2	The liquid state of oil
Alt3	Capillary action phenomenon
Alt4	Volatility of oil

51	One ton refrigeration corresponds to
Alt1	50 kcal/ min
Alt2	50 kcal/ hr
Alt3	80 kcal/ min
Alt4	80 kcal/ hr

52	The vapour pressure of refrigerant should be

Alt1	Lower than atmospheric pressure
Alt2	Higher than atmospheric pressure
Alt3	Equal to atmospheric pressure
Alt4	Could be anything

53	The number of d-electrons in Fe2+ (Z = 26) is not equal to that of
Alt1	p-electrons in Ne (Z = 10)
Alt2	s-electrons in Mg (Z = 12)
Alt3	d-electrons in Fe (Z = 26)
Alt4	p-electrons in CI (Z = 17)

54	Nowadays many novel chemicals are being synthesized termed as xenobiotics. The unique feature of these is what they are I. Biodegradable II. Non-biodegradable III. Pose on environmental threat IV. They are environment friendly
Alt1	I, III
Alt2	II, III
Alt3	I, III, IV
Alt4	II, III, IV

55	The main buffer system of the human blood is
Alt1	H2CO3 - HCO3
Alt2	H2CO3 - CO32-
Alt3	CH3COOH - CH3COO-
Alt4	NH2CONH2 - NH2CONH+

56	Serum has essentially the same composition as plasma EXCEPT that it lacks
Alt1	Albumin
Alt2	Stuart-Power factor
Alt3	Antihemophilic factor
Alt4	Hageman factor

57	Consider the operator a = x + d/dx acting on smooth functions of x. The commutator [a, cos x] is
Alt1	- sin x
Alt2	- cos x
Alt3	cos x
Alt4	0

58	The dynamics of a particle governed by the Lagrangian L= ½ mx2 – ½ kx2 – kxxt describes
Alt1	an undamped simple harmonic oscillator
Alt2	a damped harmonic oscillator with a time varying damping factor
Alt3	an undamped harmonic oscillator with a time dependent frequency
Alt4	a free particle

59	The 2 x 2 identity matrix I and the Pauli matrices σx, σy, σz do not form a group under matrix multiplication. The minimum numbers of 2 x 2 matrices, which includes these four matrices, and form a group (under matrix multiplication) is
Alt1	20
Alt2	8
Alt3	12
Alt4	16

60	The first ionization potential of K is 4.34 eV, the electron affinity of Cl is 3.82 eV and the equilibrium separation of KCl is 0.3 nm. The energy required to dissociate a KCl molecule into a K and a Cl atom is
Alt1	8.62 eV
Alt2	8.16 eV
Alt3	4.28 eV
Alt4	4.14 eV

61	The period of 2 sin x cos x is
Alt1	4π 2
Alt2	2π
Alt3	4π
Alt4	π

62	Let A (2, −3) and B(−2, 1) be vertices of a triangle ABC. If the centroid of this triangle moves on the line 2x + 3y = 1, then the locus of the vertex C is the line
Alt1	2x + 3y = 9
Alt2	2x − 3y = 7
Alt3	3x + 2y = 5
Alt4	3x − 2y = 3

63	If x dy/dx = y (log y − log x + 1), then the solution of the equation is
Alt1	y log(x/y) = cx
Alt2	x log(y/x) = cy
Alt3	log(y/x) = cx
Alt4	log(x/y) = cy

64	∫ cosx
Alt1	tanx
Alt2	secx
Alt3	sinx
Alt4	−sinx

65	A circle touches the x-axis and also touches the circle with centre at (0, 3) and radius 2. The locus of the centre of the circle is
Alt1	an ellipse
Alt2	a circle
Alt3	a hyperbola
Alt4	a parabola

66	What is the value of factorial Zero (0!)
Alt1	10
Alt2	0
Alt3	1
Alt4	-1

67	Young's Modulus of material of a wire is defined as
Alt1	Ratio of linear strain to normal stress
Alt2	Ratio of normal stress to linear strain
Alt3	Product of linear strain to normal stress
Alt4	Square root of the ratio between normal stress and linear strain

68	When light wave suffers reflection at the interface between air and glass, the change of phase of the reflected wave is equal to
Alt1	0
Alt2	$\pi/2$
Alt3	π
Alt4	2π

69	According to Charles Law
Alt1	PV = Constant
Alt2	P/V = (-) K
Alt3	V/T = Constant
Alt4	VT = K0

70	The resistance of a wire is R ohm. If the wire is stretched to double its length, its resistance will become?
Alt1	2R
Alt2	R/2
Alt3	R/4
Alt4	4R

71	Optical fiber works on the
Alt1	principle of refraction
Alt2	total internal reflection
Alt3	scattering
Alt4	interference

72	Heat transfer takes place according to
Alt1	Zeroth law of thermodynamics
Alt2	First law of thermodynamics
Alt3	Second law of thermodynamics
Alt4	Kirchoff's law

73	The 'Greenhouse effect' in atmosphere is mainly due to increase in atomospheric
Alt1	Ozone

Alt2	Nitrogen
Alt3	Carbon dioxide
Alt4	Carbon monoxide

74	Algal bloom results in
Alt1	Global warming
Alt2	Salination
Alt3	Eutrophication
Alt4	Biomagnification

75	A high biological oxygen demand (BOD) indicates that
Alt1	water is pure
Alt2	absence of microbial action
Alt3	low level of microbial pollution
Alt4	high level of microbial pollution

76	What is the maximum number of phases that can be at equilibrium with each other in a three-component mixture?
Alt1	2
Alt2	3
Alt3	4
Alt4	5

77	Which of the following is always true of a spontaneous process?
Alt1	The process is exothermic
Alt2	The process does not involve any work
Alt3	The entropy of the system increases
Alt4	The total entropy of the system plus surroundings increases

78	Infrared (IR) spectroscopy is useful for determining the certain aspects of the structure of organic molecules because
Alt1	all molecular bonds absorb IR radiation
Alt2	IR peak intensities are related to molecular mass
Alt3	most organic functional groups absorb in a characteristic region of the IR spectrum
Alt4	each element absorbs at a characteristic wavelength

79	Assuming complete dissociation, of the following solutions which will have the highest ionic strength?
Alt1	0.050 M AlCl3
Alt2	0.100 M NaCl
Alt3	0.050 M CaCl2
Alt4	0.100 M HCl

80	Cobalt – 60 is used in a radiation therapy of cancer and can be produced by bombardment of Cobalt – 59 with which of the following?
Alt1	Neutrons
Alt2	Alpha particles

Alt3	Beta particles
Alt4	X – rays

81	Which of the following observations were explained by Planck's quantum theory?
Alt1	Blackbody radiation
Alt2	Emission spectra of diatomic molecules
Alt3	Electron diffraction patterns
Alt4	Temperature dependence of reaction rates

82	Which of the following is an n-type semiconductor?
Alt1	Silicon
Alt2	Diamond
Alt3	Silicon carbide
Alt4	Arsenic-doped silicon

83	Of the following compounds, which is LEAST likely to behave as a Lewis acid?
Alt1	BeCl2
Alt2	MgCl2
Alt3	ZnCl2
Alt4	SCl2

84	The strongest base in liquid ammonia is
Alt1	NH3
Alt2	NH2–
Alt3	NH4+
Alt4	N2H4

85	Which of the following is required for both paramagnetism and ferromagnetism?
Alt1	Strong oxidizing conditions
Alt2	Low-spin electron configuration
Alt3	Metallic physical properties
Alt4	Unpaired electrons

86	Of the following atoms, which has the lowest electron affinity?
Alt1	F
Alt2	Si
Alt3	O
Alt4	Ca

87	Which of the following is a primary standard for use in standardizing bases?
Alt1	Ammonium hydroxide
Alt2	Potassium hydrogen phthalate
Alt3	Acetic acid
Alt4	Sulfuric acid

88	Formation of ozone is
Alt1	oxidation reaction

Alt2	reduction reaction
Alt3	photochemical reaction
Alt4	electrochemical reaction

89	Nutrients are recycled in ecosystem by
Alt1	Biogeochemical cycle
Alt2	Energy flow
Alt3	Producers
Alt4	Consumers

90	Driving force in an ecosystem is
Alt1	Plants
Alt2	Producers
Alt3	Solar energy
Alt4	Biomass energy

91	Two coils in differential connection have self inductance of 2mH and 4mH and a mutual inductance of 0.15mH. The equivalent inductance of the combination is
Alt1	5.7 mH
Alt2	5.85 mH
Alt3	6 mH
Alt4	6.15 mH

92	If an intrinsic semiconductor is doped with a very small amount of Boron, then the extrinsic semiconductor so formed, the number of electrons and holes will
Alt1	Decrease
Alt2	Increase and decrease respectively
Alt3	Increase
Alt4	Decrease and increase respectively

93	Photovoltaic emf of silicon solar cell is of the order of
Alt1	0.1 Volts
Alt2	0.5 Volts
Alt3	1.1 Volts
Alt4	1.72 Volts

94	The MOSFET switch in its On-state may be considered equivalent to
Alt1	Resistor
Alt2	Inductor
Alt3	Capacitor
Alt4	Battery

95	A memory system has total of 8 memory chips, each with 12 address lines and 4 data lines. The total size of the memory system is
Alt1	6 kbytes
Alt2	32 kbytes
Alt3	48 kbytes

Alt4	64 kbytes

96	The rank of the following matrix is

$$\begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$$

Alt1	0
Alt2	1
Alt3	2
Alt4	3

97	Process of generating electric power and useful heat in a single installation is known as
Alt1	Regeneration
Alt2	Cogeneration
Alt3	Total generation
Alt4	Integral production

98	For a reversible adiabatic process, the change in entropy is
Alt1	Zero
Alt2	Minimum
Alt3	Infinite
Alt4	Unity

99	In a Carnot engine, when the working fluid gives heat to sink,
Alt1	The temperature of sink increase
Alt2	The temperature of the source decrease
Alt3	The temperature of both source and sink decrease
Alt4	The temperature of sink remains same

100	Regenerative cycle thermal efficiency of a Rankine cycle
Alt1	Is same as that of simple Rankine cycle
Alt2	Is always less than that of simple Rankine cycle
Alt3	Is always greater than that of simple Rankine cycle
Alt4	None

483 PU P G Diploma Green Energy Technology

109 PU_2016_483_E
If $y = 5x^2+3$, then the tangent at x=0, y=3

○ Passes through x equals 0, y equals 0

○ has a slope +1

○ is parallel to the x-axis

○ has a slope -1

129 PU_2016_483_E
Complex conjugate of i / (1 - i) is:-

○ $-\frac{1}{2}(1+i)$

○ $\frac{1}{2}(1-i)$

○ $-\frac{1}{2}(1-i)$

○ $\frac{1}{2}(1+i)$

204 PU_2016_483_E
Crystalline structure of material exhibits :-

○ Ordered arrangement of atoms

○ Bonded atoms

○ diffused atoms

○ Coordinated atoms

208 PU_2016_483_E
The magnetic line of force travel from :-

○ South Pole to North Pole

○ North Pole to South Pole

○ East pole to west pole

○ West pole to east pole

165 PU_2016_483_E
Which of the following is a hard acid?

○ Au^+

○ Cu^+

○ Ag^+

○ Li^+

187 PU_2016_483_E
Metal are formed from the:

○ Hydrogen bond

○ Ionic bond

○ Metallic bond

○ Covalent bond

122 PU_2016_483_E
If in a triangle ABC, the altitudes from the vertices A,B,C on opposite sides are in HP, then sin A, sin B, sin C ,are in

○ G.P

○ A.P

○ H.P

○ none of the above

108 PU_2016_483_E
The possible set of eigen values of a 4x4 skew-symmestric orthogonal real matrix is:-

○ $\{0, \pm i\}$

○ $\{\pm 1\}$

○ $\{\pm i\}$

○ $\{\pm i, \pm 1\}$

209 PU_2016_483_E
Ferrite rods are used to sense the :-

○ Optical signal

○ Microwave signal

○ Electrical signal

○ Electromagnetic signal

103 PU_2016_483_E

The general solution of the first order equation $\frac{dy}{dx} = \cos(x)$ is

○ y = cos(x)+c where c is an arbitrary constant

○ y = cos(x)

y = sin(x)+c where c is an arbitrary constant

y = sin(x)

11 of 100
162 PU_2016_483_E

Acetylene has the point group:-

C_{2v}

D_{8h}

D_{6h}

C_{2h}

12 of 100
163 PU_2016_483_E

Pick out the molecule which has zero dipole moment :-

H_2O

BCl_3

NH_3

SO_2

13 of 100
186 PU_2016_483_E

A protective oxide layer is formed on the surface of metals to :-

Prevent electricity league

Prevent corrosion

Prevent fire

Prevent breakage

14 of 100
149 PU_2016_483_E

The coordination number and oxidation state of Cr in $K_3(Cr(C_2O_4)_3]$ are _____.

3 and + 3

4 and +2

3 and 0

6 and + 3

15 of 100
106 PU_2016_483_E

If a transformation y=uv transforms the given differential equation

$f(x)y'' - 4f'(x)y' + g(x)y = 0$ into the equation of the form $v'' + h(x)v = 0$ then u

must be

○ xf

○ 1/2f

○ f^2

○ $1/f^2$

205 PU_2016_483_E
Conductivity of metal arises due to the presence of :-

○ Free atoms

○ Free holes

○ Impurities

○ Free electrons

201 PU_2016_483_E
Inverter is a device that converts :-

○ DC power to AC power

○ optical to electrical power

○ AC power to DC power

○ DC power to DC power

121 PU_2016_483_E
If roots of the equation x^2-bx+c=0 be two consecutive integers, then b^2-4ac equals

○ 2

○ 1

○ 3

○ -2

140 PU_2016_483_E
The bond that gives the most intense band in the infrared spectrum for its stretching vibration is:-

○ O-H

○ S-H

○ C-H

○ N-H

202 PU_2016_483_E
An electrical transformer works under the principle of :-

○ coil induction

○ biased induction

○ Self induction

○ mutual induction

188 PU_2016_483_E
Band gap of the semiconductor decreases with:-

○ Increase with combination

○ Increase in temperature

○ Increase with doping

○ Increase in pressure

180 PU_2016_483_E
Thermal expansion of materials arise from :-

○ asymmetry of potential energy curve

○ weak bonds

○ strong bonds

○ thermal vibrations

145 PU_2016_483_E
Due to Schottky defects, the density of the crystal _____

○ Increases slightly

○ Decreases slightly

○ Remains same

○ Increases appreciable

128 PU_2016_483_E
Real solutions to the logarithmic equation ln (x) + ln (2) = 3

○ $e^3 / 2$

○ $e^3 / \ln (2)$

○ $3 / \ln (2)$

○ 3 ^{e} / 2

25 of 100
200 PU_2016_483_E
The following is the example of optical waveguide :-

○ Optical fiber

○ Silicon

○ Quartz

○ Glass

26 of 100
126 PU_2016_483_E

If $x > 1$ and $\dfrac{\sqrt{x}}{x^3} = x^m$, what is the value of m?

○ 2

○ -2

○ $-\dfrac{5}{2}$

○ $-\dfrac{3}{2}$

27 of 100
123 PU_2016_483_E
The complement of a closed set is:-

○ open or closed

○ Open set

○ closed set

○ none of the above

28 of 100
189 PU_2016_483_E
For lasing action, the semiconductor should have

○ negative gap

○ direct gap

○ indirect gap

○ gap ≥ 5 Ev

29 of 100
203 PU_2016_483_E
The AC power is the product of :-

○ I x R

○ V x R

○ none of the above

○ I x V

183 PU_2016_483_E
The degree of freedom when ice, water and water vapour coexist in equilibrium is :-

○ -1

○ Triple point

○ 0

○ 1

142 PU_2016_483_E
The bond order in CO is _____.

○ 0

○ 3

○ 4

○ 2

127 PU_2016_483_E
Find two numbers whose sum is 26 and whose product is 165

○ 9 and 17

○ 10 and 16

○ 11 and 15

○ 12 and 14

144 PU_2016_483_E
The diborane is

○ $[B_6H_{12}]$

○ $[B_2H_{12}]$

○ $[B_6H_6]^{2-}$

○ $[B_2H_6]$

161 PU_2016_483_E
The electrical resistivity of a semiconductor :-

○ Increases with temperature

○ Does not change with temperature

○ Decreases with temperature

○ Increases at lower temperature and decreases at higher temperature

35 of 100
141 PU_2016_483_E
The region of electromagnetic spectrum employed in the electron spin resonance (ESR) spectroscopy is:-

○ infrared

○ visible

○ radiowave

○ microwave

36 of 100
148 PU_2016_483_E
From the following, the most acidic compound is _____.

○ HF

○ CH_4

○ NH_3

○ H_2O

37 of 100
100 PU_2016_483_E
A parabola has the origin as its focus and the line x = 2 as the directrix. Then the vertex of the parabola is at:-

○ (1,0)

○ (2,0)

○ (0,1)

○ (0,2)

38 of 100
184 PU_2016_483_E
The error function of ∞ is :-

○ 0

○ 1

○ -1

○ ∞

39 of 100
125 PU_2016_483_E

$$\int \cos(x)\,dx$$

- ○ tan(x)
- ○ Sin(x)
- ○ sec(x)
- ○ -sin(x)

104 PU_2016_483_E
The first order differential equation M(x,y) dx+N(x,y) dy = 0 is exact if:-

- ○ $\dfrac{\partial M}{\partial x} = \dfrac{\partial N}{\partial y}$

- ○ $\dfrac{\partial M}{\partial y} = \dfrac{\partial M}{\partial x}$

- ○ $\dfrac{\partial M}{\partial y} = \dfrac{\partial N}{\partial x}$

- ○ $\dfrac{\partial M}{\partial x} \neq \dfrac{\partial N}{\partial y}$

146 PU_2016_483_E
The wave character of electron was verified by _____ experiment.

- ○ Mass spectrum
- ○ Thermal analysis
- ○ Diffraction
- ○ Photoelectric effect

105 PU_2016_483_E

If $y = \sum_{m=0}^{\infty} C_m x^{r+m}$ is assumed to be a solution of the differential equation

$x^2 y'' - xy' - 3(1 + x^2)y = 0$ then the values of r are

- ○ -1 and 3
- ○ -1 and -3
- ○ 1 and 3
- ○ 1 and -3

120 PU_2016_483_E
If $A^2 - A + I = 0$, then the inverse of A is:-

○ I-A

○ A

○ A-I

○ A+I

181 PU_2016_483_E
Hydrogen bonds are stronger than :-

○ vander Waals bonds

○ covalent bonds

○ ionic bonds

○ metallic bonds

168 PU_2016_483_E
In which one of the following reaction nitrogen is not reduced:-

○ $NO_3^- \longrightarrow NO$

○ $NO_2 \longrightarrow NO_2^-$

○ $NO_3^- \longrightarrow NH_4^+$

○ $NH_4^+ \longrightarrow N_2$

124 PU_2016_483_E
The set of real number is:-

○ unbounded above

○ countable set

○ finite set

○ Bounded above

101 PU_2016_483_E
If $|z^2-1|=|z|^2+1$, then z lies on:-

○ circle

○ ellipse

○ imaginary axis

○ Real axis

207 PU_2016_483_E
Dimensional representation of Force (F) is :-

- [Mass]*[Length]

- [Mass]*[Length]*[Time^{-2}]

- [Mass]*[Time^{-2}]

- Kg/s

206 PU_2016_483_E
There are _____ number elements present in the periodic table:-

- 122

- 118

- 175

- 108

182 PU_2016_483_E
The bulkiest side group in the monomer is in:-

- PTFE

- PVC

- teflon

- Polystyrene

166 PU_2016_483_E
In Joule-Thomson expansion :-

- dG = 0

- ds = 0

- dH = 0

- dE = 0

164 PU_2016_483_E
The conjugate base of NH_4+ is :-

- NH_3

- OH^-

- KOH

- NH_4OH

167 PU_2016_483_E

For the reaction A ⟶ Products, the plot of [A] vs time is a straight line. The order of a reaction is :-

○ Pseudo first

○ Zero

○ First

○ Second

160 PU_2016_483_E
A 1S orbital refers to :-

○ A one electron wave function

○ A hermitian operator

○ A circular track in an atom in which an electron travels

○ An observable property of the system

185 PU_2016_483_E
The fastest diffusing species in Fe is :-

○ Ni

○ W

○ C

○ H

147 PU_2016_483_E
The pH of a 10^{-8} molar HCL solution at 25°C is nearly _____.

○ 7

○ 1

○ 14

○ 10

169 PU_2016_483_E
Vitamin B_{12} is the coordination compound of :-

○ Fe

○ CO

○ Zn

○ Mg

102 PU_2016_483_E

If $\begin{bmatrix} 6i & -3i & 1 \\ 4 & 3i & -1 \\ 20 & 3 & i \end{bmatrix} = x + iy$ then

- x = 0, y = 0
- x = 0, y = 3
- x = 3, y = 1
- x = 1, y = 3

107 PU_2016_483_E
The straight lines L_1: x = 0, L_2:y = 0 and L_3: x+y = 1 are mapped by the transformation w = z^2 into the curves C_1, C_2 and C_3 respectively. The angle of intersection between the curves at w = 0 is:-

- π/4
- $\pi/4$
- π
- 0

143 PU_2016_483_E
The structure of SF_4 is _____.

- Tetrahedral
- Square planar
- Trigonal pyramidal
- Octahedral

226 PU_2016_483_M
Example of an aromatic side chain amino acid is :-

- Glycine
- Proline
- Tryptophan
- Lysine

249 PU_2016_483_M
In anerobic respiration, energy liberated by one molecule of glucose is:-

- 18 ATP

○ 30 ATP

○ 38 ATP

○ 40 ATP

63 of 100
240 PU_2016_483_M
Non-branching helical structure consisting of glucose residues in alpha-1,4 linkage is :-

○ Cellulose

○ Amylopectin

○ Amylose

○ Lignin

64 of 100
228 PU_2016_483_M
Methylation of cytosine in regulating gene expression is referred as :-

○ Mutation

○ Epigenetic transformation

○ Single Nucleotide Polymorphism

○ Genetic Engineering

65 of 100
221 PU_2016_483_M
Photosynthesis occurs in :-

○ Cytoplasm

○ Nucleus

○ Golgi

○ Thylakoid

66 of 100
227 PU_2016_483_M
RNA Polymerase is an enzyme that:-

○ Does Translation of RNA

○ Carry out replication of RNA

○ Does Transcription of DNA

○ Carry out replication DNA

67 of 100
220 PU_2016_483_M
Which of the following is not true for photosynthesis:-

○ Light reaction cannot take place in the absence of light

Dark reactions takes place in the absence of light

Dark reaction cannot take place in the presence of light

Light reaction takes place in the presence of light

223 PU_2016_483_M
Blood corpuscles which help blood clotting at the site of injury are:-

Platelets

RBCs

WBCs

RBCs and WBCs

242 PU_2016_483_M
In photosynthesis, CO_2 fixation takes place in

Light reaction

Dark reaction

In the absence of light

In the presence of light

225 PU_2016_483_M
Psychrophiles are bacteria that grow in the temperature range of

30 °C to 45 °C ;

Above 100 °C

-10 °C to 20 °C ;

45 °C to 75 °C ;

244 PU_2016_483_M
In polymerase chain reaction, denaturization temperature is set around :-

65 °C

95 °C

25 °C

37 °C

246 PU_2016_483_M
Which is one of the most poisonous excretory substance?

Uric Acid

○ Urea

○ Ammonia

○ Hippuric Acid

73 of 100
247 PU_2016_483_M
Bactrial resistance to antibiotics is a genetic train that is carried in the bacterial cell in:-

○ Plasmid

○ Chromosome

○ Interon

○ Centromere

74 of 100
245 PU_2016_483_M
The length of a DNA molecule about 3×10^6 base pair is:-

○ 1mm

○ 1cm

○ 1m

○ 1μm

75 of 100
222 PU_2016_483_M
123. Which of the following best describes anaerobic respiration?

○ Oxidation of food in the presence of oxygen

○ Oxidation of food in the absence of oxygen

○ Uptake of CO_2 and release of O_2

○ Release of CO_2 with the uptake of O_2

76 of 100
248 PU_2016_483_M
Number of ATP utilized for the formation of glucose in Calvin Cycle is:-

○ 12 ATP

○ 24 ATP

○ 18 ATP

○ 6 ATP

77 of 100
241 PU_2016_483_M
The storage polysaccharides of animal cell is called:-

○ Starch

○ Saccharin

○ Lipid

○ Glycogen

229 PU_2016_483_M
Type of function protein porin perform is:-

○ Specific binding

○ Transport

○ Degradation of proteins

○ Gene activations

224 PU_2016_483_M
Tachycardia mean:

○ Irregular heart beat

○ Stiffening of arteries

○ Increased heart beat

○ Decreased heart beat

243 PU_2016_483_M
In biochemical reaction when an inhibitor closely resembles the substrates in its molecular structure to inhibit the activity of enzyme, it is referred as:-

○ Competitive inhibitor

○ Co-substrate

○ Co-inhibitor

○ Competitive substrate

262 PU_2016_483_D
In a double strand DNA, number of hydrogen bonds formed in C-G and T-A base pairing are:-

○ Two in both cases

○ Three and Two

○ Three in both cases

○ Two and Three

282 PU_2016_483_D
In thermodynamics, Carnot cycle is also called as:-

○ Constant volume cycle

○ Constant pressure cycle

○ Constant temperature cycle

○ Constant heat cycle

83 of 100
268 PU_2016_483_D
The de-emphasis filter in an FM receiver comes:-

○ After FM demodulator and before baseband and filter

○ Before RF amplifier

○ After baseband filter

○ Before FM demodulator

84 of 100
283 PU_2016_483_D
In cooling and humidifying process, the spray water:-

○ Lowers both the dry-bulb temperature and the dewpoint temperature

○ Lowers the dry-bulb, wet-bulb and dewpoint temperatures

○ Lowers the dry-bulb temperature and raises the dewpoint temperature

○ Raises both the dry-bulb temperature and the dewpoint temperature

85 of 100
266 PU_2016_483_D
The property characteristic of ferroelectric materials is:-

○ Spontaneous magnetization

○ Spontaneous polarization

○ Dielectric breakdown

○ Dielectric relaxation

86 of 100
287 PU_2016_483_D
Adsorbents in absorption system separate from the refrigerant:-

○ Only when sufficiently heated

○ Only when cooled

○ By reacting with water

○ By means of a filter

87 of 100
281 PU_2016_483_D
In diesel cycle:-

○ Compression ratio is greater than the expansion ratio

○ Compression ratio is less than the expansion ratio

○ Compression ratio + expansion ratio equals 1

○ Compression ratio and expansion ratio are the same

88 of 100
260 PU_2016_483_D
At isoelectric pH, proteins exists in:-

○ More negatively charged than positive charge

○ As Zwitterions

○ Negatively charged form

○ Positively charged form

89 of 100
289 PU_2016_483_D
The vanes of a centrifugal pump are generally :-

○ Radial

○ Curved backward

○ Twisted

○ Curved forward

90 of 100
286 PU_2016_483_D
Heat in the absorption-refrigeration cycle is applied at:-

○ Evaporator

○ Generator

○ Cooler

○ Absorber

91 of 100
264 PU_2016_483_D
Determine the quantity of heat required to vaporize 2 m^3 of water at 0 °C if the latent heat of vaporization of water at that temperature is 2257 kJ/Kg

○ 2257 kJ

○ 1128.5 kJ

○ 4514 kJ

○ 2000 kJ

92 of 100
285 PU_2016_483_D

The unit in the refrigeration cycle in which heat is rejected is the:-

○ Evaporator

○ Compressor

○ Coil

○ Condenser

288 PU_2016_483_D
Increasing the pressure of a refrigerant :-

○ Does not affect its temperature

○ Increase its temperature

○ Lowers its boiling point

○ Decrease its temperature

269 PU_2016_483_D
On a psychrometric chart, what does a vertical downward line represent?

○ Humidification

○ Dehumidification

○ Adiabatic saturation

○ Sensible cooling

265 PU_2016_483_D
Which one of the following materials is a latent heat storage material?

○ Magnesium oxide

○ Hitec

○ Servotherm

○ Lauric acid

280 PU_2016_483_D
The Rockwell number refers to a material's :-

○ Malleability

○ Hardness

○ Plasticity

○ Toughness

284 PU_2016_483_D

Which of the following pump does not fall under the category of turbo machines ?

○ Rotary

○ Mixed flow

○ Centrifugal

○ Axial flow

263 PU_2016_483_D
Cross flow heat exchangers are popularly used for heat transfer:-

○ liquid and liquid

○ liquid and evaporating fluid

○ condensing fluid and liquid

○ gas and gas or liquid and gas

267 PU_2016_483_D
Which one of the following is correct?

Environmental protection agencies advise against the use of chlorofluorocarbon refrigerants because these react with:-

○ Plant and cause greenhouse effect

○ Water vapour and cause acid rain

○ Oxygen and cause its depletion

○ Ozone layer and cause its depletion

261 PU_2016_483_D
Molecules upon binding to an enzyme, regulate the activity of enzyme are termed as:-

○ Metabolites

○ Promotors/ suppressors

○ Mediators

○ Activators/ inhibitors

PU PG Diploma in Green Energy Technology

177 PU_2015_483
What among following is used to produce artificial rain?

C Silver iodide

C Carbon monoxide

C Copper oxide

C Silver nitrate

179 PU_2015_483
The chemical used as a fixer in photography is:-

C Sodium thiosulphate

C Borax

C Ammonium sulphate

C Sodium sulphate

169 PU_2015_483
The point group of CO_2 is:-

C D_{3h}

C $C_{\alpha v}$

C D_{2h}

C $D_{\alpha h}$

204 PU_2015_483
Photosynthesis requires:-

C CH_4

C CO_2

C O_2

C N_2

122 PU_2015_483
If A and B are symmetric matrices, then AB is symmetric if:-

C $AB \neq BA$

C $AB = BA$

C $AB > BA$

○ AB < BA

110 PU_2015_483

If $y = \sum_{m=0}^{\infty} C_m x^{r+m}$ is assumed to be a solution of the differential equation

$x^2 y'' - xy' - 3(1 + x^2)y = 0$, then the values of r are:-

○ -1 and -3

○ 1 and 3

○ -1 and 3

○ 1 and -3

170 PU_2015_483
The structure of O_3 and N_3- are:-

○ Both linear

○ Both bent

○ Linear and bent, respectively

○ Bent and linear, respectively

198 PU_2015_483
Which of the following is a greenhouse gas?

○ SO_2

○ CO_2

○ CO

○ NO_2

112 PU_2015_483
The straight lines L1: x = 0, L_2: y = 0 and L_3: x + y = 1 are mapped by the transformation w = z^2 into the curves C_1, C_2 and C_3 respectively. The angle of intersection between the curves at w = 0 is:-

○ π

○ $\pi/4$

○ 0

○ $\pi/4$

162 PU_2015_483
Ferromagnetic metal among the following is:-

- Cu
- Co
- Na
- Mg

103 PU_2015_483

Solution of the differential equation $\dfrac{d^2x}{dy^2} + x = 0, x = 0$ at $y = 0$ and $x = 1$ at $y = \pi/2$:-

- $x = \cos(y)$
- $\sin^{-1}(y)$
- $x = \sin(y)$
- $x = \sin(y) + \cos(y)$

202 PU_2015_483
Phytochrome pigment is present in:-

- Stems
- Flowers
- Leaves
- Fruits

212 PU_2015_483
Beta sheets in a protein are formed due to:-

- Ionic bond between the residues
- Due to sulphur bridge between two residues
- Covalent bonding between amino acids in a polypeptide
- Hydrogen bonding between polypeptide chain

160 PU_2015_483
The more stable carbon ion among the following is:-

- Cyclopentadienyl anion
- Alkyl anion
- Methyl anion
- Pentadienyl anion

190 PU_2015_483
cDNA is:-

O Complementary of genomic DNA

O Complementary of plasmid DNA

O Complementary of mRNA

O Complementary of B-DNA

218 PU_2015_483
Dark reaction refers to the reduction of:-

O Oxygen

O CO_2

O Water

O Hydrogen

164 PU_2015_483
Osmimum tetroxide is a reagent used for:-

O Hydroxylation of olefins to give trans diols

O Hydroylation of acetylene

O Hydroxylation of carbonyl compounds

O Hydroxylation of olefins to give cisdiols

154 PU_2015_483
Among the following, the power device is:-

O Battery

O Fuel cells

O Supercapacitors

O None

193 PU_2015_483
Number of hydrogen bonds between Thiamine and Adenosine is:-

O Four

O Three

O One

O Two

196 PU_2015_483
Which part of the embryo comes out first of all from the seed during germination?

○ Radicle

○ Hypocotyle

○ Plumule

○ Cotyledon

132 PU_2015_483
If Pdx + xsin(y) dy = 0 is exact, then p can be:-

○ -sin(y)

○ x^2 - cos(y)

○ cos(y)

○ Sin(y) + cos(y)

165 PU_2015_483
The criteria for spontaneity of a reaction is:-

○ ΔG = +ve

○ ΔG = 0

○ ΔG = - ve

○ None

142 PU_2015_483
An element 'X' emits successively two α particles. The mass and atomic numbers of the element are decreased by, respectively:-

○ 4 and 8

○ 4 and 4

○ 4 and 6

○ 2 and 4

215 PU_2015_483
Okazaki fragment relate to:-

○ Partially synthesized mRNA

○ DNA fragment that help synthesis of lagging strand

○ SiRNA fragments

○ DNA primers for leading strand synthesis

136 PU_2015_483

The coefficient of $(z - \pi)^2$ in the Taylor expansion of $f(z) \begin{cases} \dfrac{\sin(z)}{z-\pi} & if\, z \neq \pi \\ -1 & if\, z = \pi \end{cases}$ around π is:-

☐ 1/6

☐ -1/6

☐ -1/2

☐ 1/2

211 PU_2015_483
Study of Epigenetic gene regulation relates to:-

☐ Cytosine deletion causing genetic disease

☐ Methylation of cytosine regulating gene expression

☐ Transformation of cytosine to Uracil

☐ Base pair mismatch due to mutation

180 PU_2015_483
Enzyme that are used to hydrolyse fats into diglycerides, monoglycerides, fatty acids and glycerol is:-

☐ Lipase

☐ Zymase

☐ Cellulase

☐ Protease

117 PU_2015_483

The matrix $A = \begin{bmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$ is:-

☐ Orthogonal

☐ Hermitian

☐ Unitary

☐ Skew Hermitian

173 PU_2015_483

The number of peaks in the EPR spectrum of $CH_3{}^\bullet$ radical is:-

☐ 1

- [ ] 2
- [ ] 4
- [ ] 3

157 PU_2015_483
Which of the following is an ore of magnesium?

- [ ] Limonite
- [ ] Dolomite
- [ ] Hematite
- [ ] Goethite

163 PU_2015_483
An example for the species having quadruple bond is:-

- [ ] $Cr_2O_7^{2-}$
- [ ] $Re_2Cl_8^{2-}$
- [ ] $Hg_2(CH_3COO)_2$
- [ ] $Mn_2(CO)_{10}$

205 PU_2015_483
Component of the blood which help in clotting at the site of injury are:-

- [ ] WBCs
- [ ] Platelets
- [ ] RBCs
- [ ] Plasma serum

131 PU_2015_483
Which of the following is a linear differential equation?

- [ ] $\frac{dy}{dx} + y(y + x) = x^2$
- [ ] $(1 + y)\frac{dy}{dx} + + \sin(x) = 0$
- [ ] $\frac{dy}{dx} - x^2y = \sin(x)$
- [ ] $\frac{dy}{dx} + x^2y = \sin(y)$

147 PU_2015_483

The most symmetrical crystal system is:-

☐ Trigonal

☐ Cubic

☐ Triclinic

☐ Rhombohedral

140 PU_2015_483
Which of the following molecules show EPR resonance?

☐ CO_2

☐ O_2

☐ H_2O

☐ H_2O_2

207 PU_2015_483
The flight or flight response is developed by hormone of the:-

☐ Medulla oblongata

☐ Adrenal medulla

☐ Hypothalamus

☐ Adrenal cortex

194 PU_2015_483
Photorespiration is:-

☐ Sequestration of O_2

☐ Sequestration of CO_2

☐ Consumption of CO_2 and release of O_2

☐ Consumption of O_2 and release of CO_2

120 PU_2015_483

The value of $\int_{-1}^{2} x^3 \, dx$ is:-

☐ -9

☐ 15

☐ 15/4

☐ 17/4

206 PU_2015_483
The directional movement or orientation of a plant part in response to light is termed as:-

⬜ Thigmotaxis

⬜ Chemotropism

⬜ Photoperiodism

⬜ Phototropism

152 PU_2015_483
An example for a thermodynamic state function is:-

⬜ Temperature

⬜ Pressure

⬜ Volume

⬜ All

113 PU_2015_483
The possible set of eigen values of a 4 x 4 skew-symmetric orthogonal real matrix is:-

⬜ $\{\pm i\}$

⬜ $\{0, \pm i\}$

⬜ $\{\pm i, \pm 1\}$

⬜ $\{\pm 1\}$

137 PU_2015_483

Let $f(x) = \sum_{n=1}^{\infty} \frac{\sin(nx)}{n^2}$ then:-

⬜ $\lim_{x \to 0} f(x) = 1$

⬜ $\lim_{x \to 0} f(x) = \pi^6/2$

⬜ $\lim_{x \to 0} f(x)$ does not exist

⬜ $\lim_{x \to 0} f(x) = 0$

210 PU_2015_483
RNA Polymerase is an enzyme that:-

⬜ Replicate RNA

⬜ Translate RNA

⬜ Replicate DNA

⬜ Transcribe DNA

109 PU_2015_483
The volume of the parallelepiped above whose edges are represented

by $\vec{a} = 2\hat{i} - 3\hat{j} + 4\hat{k}$ $\vec{b} = \hat{i} + 2\hat{j} - \hat{k}$ $\vec{c} = 3\hat{i} - \hat{j} + 2\hat{k}$ is:-

☐ 15

☐ 7

☐ 28

☐ 6

151 PU_2015_483
The absorption maximum of CdS is 470 nm. The approximate band gap in eV is:-

☐ 4.63

☐ 3.63

☐ 1.63

☐ 2.63

119 PU_2015_483
The triangle of maximum area inscribed in a circle of radius r is:-

☐ An equilateral triangle

☐ A right angled triangle with hypotenuse measuring 2r

☐ An isosceles triangle of height r

☐ None of the above

166 PU_2015_483
The electrolyte used in lead-acid battery is:-

☐ H_2SO_4

☐ HNO_3

☐ H_2O

☐ HCl

148 PU_2015_483
A compound shows IR absorption at 1800 cm^{-1}. The compound can be:-

☐ Acid chloride

☐ Aryl ketone

☐ Ester

☐ Amide

155 PU_2015_483
A complex compound in which the oxidation number of a metal is zero is:-

☐ $Ni[CO]_4$

☐ $K_4[Fe(CN)_6]$

☐ $K_3[Fe(CN)_6]$

☐ $[Pt(NH_3)_4]Cl_2$

118 PU_2015_483

The maximum value of $\frac{1}{\sqrt{2}}(sinx - cosx)$ is:-

☐ $\sqrt{2}$

☐ 1

☐ $\frac{1}{\sqrt{2}}$

☐ 0

153 PU_2015_483
An octahedral metal ion M^{2+} has magnetic moment of 4.0 BM. The correct combination of metal ion and 'd' electron configuration is:-

☐ $Fe^{2+}, t_2g^4 eg^2$

☐ $Cr^{2+}, t_2g^4 eg^1$

☐ $Mn^{2+}, t_2g^3 eg^1$

☐ $Co^{2+}, t_2g^5 eg^2$

208 PU_2015_483
For an ecosystem, which of the following is incorrect?

☐ Energy movement is unidirectional

☐ Energy movement is from higher to lower trophic level

☐ Energy is lost irretrievably

☐ Energy movement is non-cyclic

200 PU_2015_483
Phytoplanktons are:-

☐ Primary consumers

☐ Secondary consumers

Tertiary consumers

Producers

105 PU_2015_483

For XOR operator $\ominus$, which one is not correct?

$0 \ominus 1 = 1$

$1 \ominus 1 = 0$

$1 \ominus 0 = 1$

$0 \ominus 0 = 1$

183 PU_2015_483
Chloroflorocarbon in the atmosphere causes depletion of:-

Oxygen

Carbondioxide

Ozone

Nitrogen

145 PU_2015_483
Of the following metals, the softest is:-

Al

Na

Mo

Rb

203 PU_2015_483
End product of glycolysis is:-

Ethanol

Pyruvic acid

Glycol

Glucose

134 PU_2015_483

$\int_a^b x^{-1+\varepsilon} \, dx$ where $\varepsilon \to 0$ is :-

0

○ $\dfrac{1}{\varepsilon}$

○ ln(b/a)

○ $b^{\varepsilon} - a^{\varepsilon}$

186 PU_2015_483
Psychrophiles are bacteria that grow in the temperature range of:-

○ -10° C to 20° C

○ 15° C to 45° C

○ 30° C to 75° C

○ Above 100° C

214 PU_2015_483
Which of the following can terminate the continuation of phosphodiester bonding?

○ DNA hybridization

○ Nucleotides

○ Dideoxynucleotides

○ Deoxynucleotides

256 PU_2015_483
No two electrons will have all the four quantum numbers equal. This statement is known as:-

○ Pauli exclusion principle

○ Aufbau's principle

○ Uncertainty principle

○ Hund's rule

239 PU_2015_483

The rank of the matrix is $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$ is:-

○ 3

○ 1

○ 2

○ 0

221 PU_2015_483
The one which is not compatible with crystal symmetry is:-

○ One-fold symmetry

○ Three-fold symmetry

○ Six-fold symmetry

○ Five-fold symmetry

224 PU_2015_483
Electronic contribution to the specific heat of a metal at low temperature is:-

○ A linear function of T

○ An exponential function of T

○ Zero

○ None of the above

220 PU_2015_483
At ordinary temperatures the molecules remain in their:-

○ Can remain in any vibrational level

○ Lowest vibrational level

○ Highest vibrational level

○ Does not show any type of vibration

249 PU_2015_483
The probability that in a family of 4 children there will be at least one Boy is:-

○ $\dfrac{5}{16}$

○ $\dfrac{15}{16}$

○ $\dfrac{1}{16}$

○ $\dfrac{3}{16}$

244 PU_2015_483
Stars twinkle, whereas planets do not, because:-

○ Planets merely reflect light, whereas stars emit light

○ Stars pulsate

○ Stars are more point like us

○ None of the above

241 PU_2015_483
The frequency of a television transmitter is:-

○ 100 MHz

○ 1 MHz

○ 10 MHz

○ 100 kHz

228 PU_2015_483
The temperature at which a conductor becomes a superconductor is called:-

○ Superconducting temperature

○ Transition temperature

○ Onne's temperature

○ Curie temperature

242 PU_2015_483

The equation $x^5 + x^4 + x^3 + 1 = 0$.

○ Has 5 roots

○ Has no roots

○ Has 4 roots

○ Has 6 roots

245 PU_2015_483
Materials that are good electrical conductors also tend to be good thermal conductors because:-

○ Surface states are important in both processes

○ Conduction electrons contribute to both processes

○ They have energy gaps between the allowed electron energy bands

○ They have highly elastic lattice structures

259 PU_2015_483
A second order phase transition is characterized by:-

○ A discontinuous change in its specific heat

○ Irreversible behaviour during warming and cooling

○ A latent heat

○ A change in volume

255 PU_2015_483
Boolean algebra is based on:-

○ Symbols

○ Logic

○ Numbers

○ All of the above

226 PU_2015_483
A semiconductor with equal concentration of acceptor and donor type of impurities is termed as:-

○ Intrinsic

○ Amphoteric

○ Compensated

○ None of the above

230 PU_2015_483
The energy of a phonon is:-

○ Infinite

○ $\hbar v$

○ $\hbar \omega$

○ $\hbar k$

257 PU_2015_483
Matter waves are:-

○ Always travel with speed of light

○ Electromagnetic

○ Show diffraction

○ Longitudinal

238 PU_2015_483

Which one of the following particles does not have a spin $\frac{1}{2}$?

○ Photon

Neutron

Proton

Neutrino

247 PU_2015_483
Physical origin of optical theorem is the conservation of:-

Mass

Energy

Momentum

Particles

240 PU_2015_483

If L = inductance and R = resistance, what unit does $\frac{L}{R}$ have?

Amperes

Sec

Sec^{-1}

None of the above

251 PU_2015_483
For obtaining maximum power from a solar cell, it should be operated on:-

Horizontal part of the curve

Falling portion of V-I characteristics

The knee of the V-I characteristics

Any part of the V-I characteristics as power does not depend on it

268 PU_2015_483
Which of the following is an intensive property of a thermodynamic system?

Temperature

Energy

Volume

Mass

298 PU_2015_483
Air can be best heated by steam in a heat exchanger of:-

○ Shell and tube type

○ Double pipe type with fins on steam side

○ Double pipe type with fins on air side

○ Plate type

297 PU_2015_483
Thermal diffusivity of a substance is:-

○ Directly proportional to the square of thermal conductivity

○ Inversely proportional to thermal conductivity

○ Inversely proportional to the square of thermal conductivity

○ Directly proportional to thermal conductivity

275 PU_2015_483
In vapour compression cycle, the condition of refrigerant is superheated vapour:-

○ After passing through the expansion or throttle valve

○ Before entering the expansion valve

○ Before passing through the condenser

○ After passing through the condenser

264 PU_2015_483
The measurement of a thermodynamic property known as temperature is based on:-

○ First law of thermodynamics

○ Zeroth law of thermodynamics

○ Second law of thermodynamics

○ None of the above

288 PU_2015_483
A cycle consisting of _____ and two isothermal processes is known as Stirling cycle.

○ Two constant pressure

○ Two constant volume

○ Two isentropic

○ One constant pressure, one constant volume

276 PU_2015_483
Metals are good conductors of heat because:-

○ They contain free electrons

○ Their atoms are relatively far apart

○ They have high density

○ Their atoms collide frequently

278 PU_2015_483
LMTD in case of counter flow heat exchanger as compared to parallel flow heat exchanger is:-

○ Depends on the area of heat exchanger

○ Lower

○ Same

○ Higher

260 PU_2015_483
A closed system is one in which:-

○ Both energy and mass cross the boundaries of the system

○ Neither mass nor energy cross the boundaries of the system

○ Mass crosses the boundary but not the energy

○ Mass does not cross boundaries of the system, though energy may do so

261 PU_2015_483
For a perfect gas, according to Boyle's law (where p = Absolute pressure, v = Volume and T = Absolute temperature):-

○ p v = constant, if T is kept constant

○ p/T = constant, if v is kept constant

○ T/p = constant, if v is kept constant

○ v/T = constant, if p is kept constant

272 PU_2015_483
Thermal conductivity of solid metals with rise in temperature normally:-

○ Remains constant

○ May increase or decrease depending on temperature

○ Increases

○ Decreases

289 PU_2015_483

Where does the lowest temperature occur in a vapour compression cycle?

☐ Evaporator

☐ Condenser

☐ Compressor

☐ Expansion valve

277 PU_2015_483
A non‑dimensional number generally associated with natural convection heat transfer is:-

☐ Nusselt number

☐ Prandtl number

☐ Grashoff number

☐ Weber number

286 PU_2015_483
In vapour compression cycle, the condition of refrigerant is saturated liquid:-

☐ Before passing through the condenser

☐ After passing through the expansion throttle valve

☐ Before entering the expansion valve

☐ After passing through the condenser

293 PU_2015_483
The value of solar constant is:-

☐ 1763 W/m^2

☐ 1000 W/m^2

☐ 1637 W/m^2

☐ 1367 W/m^2

290 PU_2015_483
Two plates spaced 150 mm apart are maintained at 1000°C and 70°C. The heat transfer will take place mainly by:-

☐ Convection

☐ Forced convection

☐ Free convection

☐ Radiation

284 PU_2015_483
The critical radius is the insulation radius at which the resistance to heat flow is:-

C Zero

C Minimum

C Maximum

C None of the above

271 PU_2015_483
According to First law of thermodynamics:-

C Internal energy, enthalpy and entropy during a process remains constant

C Total internal energy of a system during a process remains constant

C Work done by a system is equal to the heat transferred by the system

C Total energy of a system remains constant

279 PU_2015_483
Fourier's law of heat conduction is valid for:-

C One dimensional cases only

C Two dimensional cases only

C Regular surfaces having non-uniform temperature gradients

C Three dimensional cases only

281 PU_2015_483
In free convection, heat transfer transition from laminar to turbulent flow is governed by the critical value of the:-

C Reynold's number, Grashoff's number

C Reynold's number

C Grashoff's number

C Prandtl number, Grashoff's number