Examination: **M.Tech. Green Energy Technology**

Section 1 - Section 1

Question No.1 4.00

Bookmark

The frequency of damped oscillations as compared to frequency of undamped vibrations with viscous damping, is

- Less
- More
- Same
- Zero

Question No.2 4.00

Bookmark

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

- Rarely
- Disinterestedly
- Irregularly
- Regularly

Question No.3 4.00

Bookmark

A partial differential equation requires

- Two or more independent variables
- Exactly one independent variable
- Equal number of dependent and independent variables
- More than one dependent variable

Question No.4 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
- 5000
- 617
- 4000

Question No.5 4.00

Bookmark

Which among the following amino acid residue is most likely getting phosphorylated in prokaryotes?

- Serine
- Tyrosine
- Threonine
- Histidine

Question No.6 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
- nonlinear; 3rd order
- nonlinear; 1st order
- linear; 3rd order

Question No.7 4.00

Bookmark

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

- 0
- 2
- 1
- 3

Question No.8 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?

- 4600 N
- 5400 N
- 5000 N
- 400 N

Question No.9 4.00

Bookmark

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

- $\frac{wl^3}{4EI}$
- $\frac{wl^4}{8EI}$
- $\frac{wl^4}{16EI}$
- $\frac{wl^2}{4EI}$

aglasem.com

421

Question No.10 4.00

Bookmark

Which number replaces the question mark?

- 9
- 10
- 12
- 11

Question No.11 4.00

Bookmark

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

- ferocious
- harmful
- deadly
- poisonous

Question No.12 4.00

Bookmark

Chelate effect is

- due to equal contribution of entropy and enthalpy change
- predominantly due to entropy change
- predominantly due to enthalpy change
- independent of ring size

Question No.13 4.00

Bookmark

Which is the most economical section for a beam

- I- Section
- Circular
- Square
- Rectangular

Question No.14 4.00

Bookmark

The vapour of a pure substance, when cooled under a pressure less than its triple-point pressure

- Liquefies first and then solidifies
- Solidifies directly
- Liquefies
- Remains unchanged

Question No.15 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
- Coulomb's square law
- Gauss's law
- Maxwell's first law

Question No.16 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

- Integrating factor
- Singular solution
- General solution
- Particular solution

Question No.17 4.00

Bookmark

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

- 1:1
- 1000:1
- 100:1
- 40,000:1

Question No.18 4.00

Bookmark

In a transformer the energy is conveyed from primary to secondary

- Through air
- By the flux
- Through cooling coil
- Both air and cooling coil

aglasem.com

Question No.19 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
- During the collision, the system does not lose energy
- Gas molecules have mass but no volume
- Particles exert same force per unit area on all sides of the container

Question No.20 4.00

Bookmark

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

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

- $x^2 + y^2$
- sin (3x - 3y)
- cos (3x - y)
- $e^{-3\pi x}\sin(\pi y)$

Question No.21 4.00

Bookmark

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
- Tarun-Nyna, Shyam-Sunita
- Shyam-Sunita, Vimal-Manisha

Question No.22 4.00

Bookmark

The following are the example for mobile elements

- Fe, Ca
- Mn, Mo
- Bo, S
- Cu, Mg

Question No.23 4.00

Bookmark

In a molecule of chlorine trifluoride, ClF3 bond angle is

- 107.5^o
- 78.5^o
- 87.5^o
- 109.5^o

Question No.24 4.00

Bookmark

Beta particles are emitted

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

Question No.25 4.00

Bookmark

In a silicon transistor $\alpha_{dc} = 100$, $V_{CC} = 30V$, $R_C = 1.5\ k\Omega$. The saturation collector current of the transistor is

- 20mA
- 30mA
- 10mA
- 100mA

Question No.26 4.00

aglasem.com

Bookmark

In recent times, the number of cases of death by poisoning _____ sharply.

- increased
- have increased
- had increased
- has increased

Question No.27 4.00

Bookmark

Choose the correct meaning of the italicized idiom.
You cannot throw *dust into my eyes.*

- Abuse me
- Terrify me
- Cheat me
- Hurt me

Question No.28 4.00

Bookmark

Water use efficiency is minimum in

- CAM plants
- All higher plants
- C4 plants
- C3 plants

Question No.29 4.00

Bookmark

The decreasing order of dipole moment of molecules is

- $NH_3 > NF_3 > H_20$
- $H_20 > NH_3 > NF_3 >$
- $NF_3 > NH_3 > H_20$
- $H_20 > NF_3 > NH_3$

Question No.30 4.00

Bookmark

In mitochondria, oxidation of one molecule of NADH results in formation of

- One molecule of ATP
- Two molecules of ATP
- Three molecules of ATP
- Four Molecules of ATP

Question No.31 4.00

Bookmark

"Silent spring" written by Rachel Carson deals with

- Excessive use of pesticides
- Air pollution
- Deforestation
- Water pollution

Question No.32 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.33 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?

- 28
- 35
- 32
- 25

Question No.34 4.00

Bookmark

These boys need some new books, _____?

- is it?
- isn't it?
- don't they?
- do they?

Question No.35 4.00

Bookmark

The rate constant of unimolecular reaction was $2.66 \times 10^{-3}\ s^{-1}$ and $2.2 \times 10^{-1}\ s^{-1}$ at T= 120 K and 360 K respectively. The rate constant (in s^{-1}) at 240 K would be:

- 4.8×10^{-2}
- 1.8×10^{-3}
- 2.4×10^{-2}

aglasem.com

- 2.4×10^{-1}

Question No.36 4.00

Bookmark

Which among the following is a C4 plant?

- Sugarcane
- Paddy
- Wheat
- Red gram

Question No.37 4.00

Bookmark

A semiconductor is known to have an electron concentration of $8x10^{19}$ m^{-3} and a hole concentration of $5x10^{18}$ m^{-3} (electron mobility = 2.0 and hole mobility = 0.01). The resistivity of the semiconductor is

- 25.6Ωm
- 0.256Ωm
- 2.56Ωm
- 256Ωm

Question No.38 4.00

Bookmark

The classical experiments of variation in plants by Gregor Mendel was performed in

- Arabidopsis
- Maize
- Rice
- Pea

Question No.39 4.00

Bookmark

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

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

Question No.40 4.00

Bookmark

A solution to a boundary value problem which satisfies boundary condition is a solution to the

- logical equation
- Differential equation
- Maxwell's equation
- Integral equation

Question No.41 4.00

Bookmark

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

- If $A^2 = I$, then $A = I$.
- 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.

Question No.42 4.00

Bookmark

All the Eigen value of an orthogonal matrix are of unit modulus.

- The Eigen values of an orthogonal matrix may be any real matrix.
- true
- All are false.
- false

Question No.43 4.00

Bookmark

The dimensions of capacitance are

- $M^{-1}L^{-2}T^{2}Q^{1}$
- $M^{-1}L^{-1}T^{2}Q^{2}$

aglasem.com

- $M^{-2}L^{-2}T^{2}Q^{2}$
- $M^{-1}L^{-2}T^{2}Q^{2}$

Question No.44 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

- 1
- 4
- 2
- 0.5

Question No.45 4.00

Bookmark

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

- KE
- SH
- TS
- SX

Question No.46 4.00

Bookmark

The knee voltage of a crystal diode is approximately equal to

- Barrier Potential
- Breakdown Voltage
- Forward Voltage
- Applied Voltage

Question No.47 4.00

Bookmark

Iodinevalue of lipids is a measure of

- Degree of polysaturation of lipids
- Degree of monosaturation of lipids
- Degree of saturation of lipids
- Degree of unsaturation of lipids

Question No.48 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

- 35
- 27
- 32
- 31

Question No.49 4.00

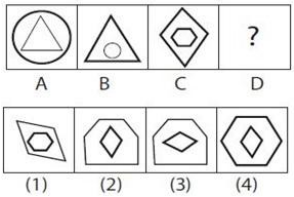
Bookmark

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

- 0.200 kgf
- Zero
- 0.600 kgf
- 0.400 kgf

Question No.50 4.00

Bookmark



- 1
- 3
- 4
- 2

Question No.51 4.00

Bookmark

In a transistor _____

- IE = IC + IB
- IB = IC + IE
- IC = IE + IB

aglasem.com

- IE = IC - IB

Question No.52 4.00

Bookmark

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

- multiple of 3
- Even
- multiple of 6
- Odd

Question No.53 4.00

Bookmark

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

- 1 1 1
- 0 0 2
- 1 1 0
- 0 0 1

Question No.54 4.00

Bookmark

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

- Square planar and square planar
- Tetrahedral and tetrahedral
- Tetrahedral and square planar
- Square planar and tetrahedral

Question No.55 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.56 4.00

Bookmark

The efficiency of a Carnot engine working between 0^oC and 100^oC

- 1
- 100/273
- 100/373
- 0.5

Question No.57 4.00

Bookmark

Which of the following biological macromolecules are structurally diverse in living world?

- Carbohydrates
- Nucleic acids
- Proteins
- Lipids

Question No.58 4.00

Bookmark

As the temperature of transistor goes up, the base-emitter resistance _____

- Decreases
- First increases and then decreases
- Remains Same
- Increases

Question No.59 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

- 26
- 23
- 25
- 24

Question No.60 4.00

Bookmark

A dielectric material must be

- Resistor
- Good Conductor
- Semi conductor
- Insulator

aglasem.com

Question No.61 4.00

Bookmark

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

- ^{19}Na and ^{14}B
- ^{19}Na and ^{14}N
- ^{19}F and ^{14}B
- ^{19}F and ^{14}N

Question No.62 4.00

Bookmark

How many atoms are there in an element packed in a FCC structure

- 4
- 1
- 83
- 2

Question No.63 4.00

Bookmark

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

- XMVIZ
- FUDQH
- BQZMD
- HWFSJ

Question No.64 4.00

Bookmark

During tensile test, what does percentage elongation indicate

- Creep
- Malleability
- Ductility
- Fatigue Strength

Question No.65 4.00

Bookmark

If three 18μF capacitors are connected in series, the net capacitance is

- 18μF
- 6μF
- 54μF
- 0μF

Question No.66 4.00

Bookmark

A field line and an equipotential surface are

- Inclined at 30^o
- Inclined at 210^o
- Always parallel
- Always at 90^o

aglasem.com

Question No.67 4.00

Bookmark

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

- A,B and C
- B and C
- A and B
- A and C

Question No.68 4.00

Bookmark

Correct sequence flow of reaction in bioethanol production

- Enzyme hydrolysis- Fermentation-distillation- bioethanol
- Distillation- Enzyme hydrolysis- Fermentation- - bioethanol
- Enzyme hydrolysis- distillation- Fermentation- bioethanol
- Fermentation- Enzyme hydrolysis- distillation- bioethanol

Question No.69 4.00

Bookmark

Moment of inertia of an object does not depend upon

- Angular velocity
- Mass of object
- Mass of distribution
- Axis of rotation

Question No.70 4.00

Bookmark

Which of the following is an “even” function of t?

- $\sin(2t) + 2t$

- Sin (2t) + 3t
- $t^2 - 4t$
- t^2
- $t^3 + 6$

Question No.71 4.00

Bookmark

Which is an intensive property?

- Refractive index
- Weight
- Mass
- Volume

Question No.72 4.00

Bookmark

The reverse current in a diode is of the order of

- kA
- μ A
- Amps
- mA

Question No.73 4.00

Bookmark

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

- Leucine
- Histidine
- Proline
- Glycine

Question No.74 4.00

Bookmark

The excess of pressure inside a bubble in a liquid is

- 3T/r
- T/r
- 4T/r
- 2T/r

Question No.75 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

- −1.5
- −1.2
- −1.7
- −4

Question No.76 4.00

Bookmark

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 neither I nor II is implicit
- If both I and II are implicit
- If only assumption I is implicit
- If only assumption II is implicit

Question No.77 4.00

Bookmark

A differential equation is considered to be ordinary if it has

- More than one independent variable
- One dependent variable
- One independent variable
- More than one dependent variable

Question No.78 4.00

Bookmark

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

- A is independent of R
- $A \alpha 1/\sqrt{R}$

aglasem.com

- $A \alpha 1/R$
- $A \alpha 1/R^2$

Question No.79 4.00

Bookmark

Analysis of boundary value problem involves functions of a differential operator. These functions are

- logical function
- algebraic function
- symmetric function
- Eigen function

Question No.80 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

- 2Ω
- 2.5Ω
- 1Ω
- 0.5Ω

Question No.81 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
- Charan
- Aasha

aglasem.com

Question No.82 4.00

Bookmark

Transplastomics

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

Question No.83 4.00

Bookmark

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

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

Question No.84 4.00

Bookmark

Proteins specific to sugars are called

- Myoglobin
- Chitin
- Lectin
- Pectin

Question No.85 4.00

Bookmark

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

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

Question No.86 4.00

Bookmark

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

- Linear with fixed constants
- Undeterminable to be linear or nonlinear
- Nonlinear
- Linear

Question No.87 4.00

Bookmark

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

- Linoleic acid
- Alpha-linolenic acid
- Eicosapentaenoic acid
- Docosahexaenoic acid

Question No.88 4.00

Bookmark

The path of a magnetic flux in a transformer should have

- High reluctance
- Low resistance
- High resistance
- Low reluctance

Question No.89 4.00

Bookmark

A square matrix [A] is lower triangular if

- $a_{ij} \neq 0, i > j$
- $a_{ij} = 0, j > i$
- $a_{ij} = 0, i > j$
- $a_{ij} \neq 0, j > i$

Question No.90 4.00

Bookmark

Which is NOT required for "DNA replication?"

- Polymerase
- Helicase
- Kinase
- Primase

Question No.91 4.00

Bookmark

The angular momentum of the electron in the hydrogen atom can be

- $h/4\pi$
- $2h$
- $3h$
- h/π

Question No.92 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?

- Convection
- Purification
- Conduction
- Radiation

Question No.93 4.00

Bookmark

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

- inception
- advent
- inauguration
- initiation

Question No.94 4.00

Bookmark

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

- variable set
- pair set
- order set

aglasem.com

- order set
- solution set

Question No.95 4.00

Bookmark

The unit of capacitance is

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

Question No.96 4.00

Bookmark

Choose the best antonym of the italicized word.
There are four chapters that are *extraneous* to the structure of the book.

- needful
- important
- integral
- relevant

Question No.97 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

- 1904 J
- 2408 J
- 2072 J
- 2240 J

Question No.98 4.00

Bookmark

Choose the best synonym of the italicized word. The prisoners of war signed the document under *coercion.*

- supervision
- confusion
- security
- compulsion

Question No.99 4.00

Bookmark

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?

- B
- C
- A
- D

Question No.100 4.00

Bookmark

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 neither I nor II follows
- If only conclusion I follows
- If only conclusion II follows

aglasem.com

Sr No.	MTech 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

aglasem.com

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

aglasem.com

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

aglasem.com

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

aglasem.com

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

aglasem.com

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

aglasem.com

Alt1	Fe_2O_3
Alt2	Fe_3OH_4
Alt3	$FeCO_3$
Alt4	$3Fe_2O_3$ & $3H_2O$

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

aglasem.com

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

aglasem.com

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 Cl (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	H_2CO_3 - HCO_3
Alt2	H_2CO_3 - CO_3^{2-}
Alt3	CH_3COOH - CH_3COO^-
Alt4	NH_2CONH_2 - NH_2CONH^+

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 $L = \frac{1}{2} mx^2 - \frac{1}{2} kx^2 - kxxt$ 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

aglasem.com

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

aglasem.com

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	π/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

aglasem.com

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

aglasem.com

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	$BeCl_2$
Alt2	$MgCl_2$
Alt3	$ZnCl_2$
Alt4	SCl_2

84	The strongest base in liquid ammonia is
Alt1	NH_3
Alt2	NH_2^-
Alt3	NH_4^+
Alt4	N_2H_4

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

aglasem.com

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

aglasem.com

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

aglasem.com

307 PU M Tech Green Energy Technology

1 of 100
129 PU_2016_307
The maximum slope of the curve x^2+6x^2+2x+1 is:-

- 16
- 19
- -13
- 14

2 of 100
119 PU_2016_307
The triangle of maximum area inscribed in a circle of radius r is:-

- An isosceles triangle of height r
- An equilateral triangle
- A right angled triangle with hypotenuse measuring 2r
- None of these

3 of 100
136 PU_2016_307

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

around π is:-

- 1/6
- -1/6
- 1/2
- -1/2

4 of 100
115 PU_2016_307

If $A\begin{bmatrix}-2 & 1\\ 3 & 5\end{bmatrix}=\begin{bmatrix}-1 & 7\\ -1 & 20\end{bmatrix}$ then the matrix A is equal to:-

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

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

5 of 100

121 PU_2016_307

The area bounded by the curves y =√x , 2y+3πx and x axis in the first quadrant is:-

- π/2
- π/4
- 9
- 18

6 of 100

137 PU_2016_307

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

- $lim_{x \to 0} f(x) = 0$
- $lim_{x \to 0} f(x) = \pi^6/2$
- $lim_{x \to 0} f(x) doesnot\ exist$
- $lim_{x \to 0} f(x) = 1$

7 of 100

103 PU_2016_307

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

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

8 of 100

111 PU_2016_307

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:-

- 1/f2
- xf

- f^2
- 1/2f

9 of 100

125 PU_2016_307

If a function f(z)=u(x,y)+iv(x,y) of the complex variable z=x+iy, where x, y, u and v are real, is analytic in a domain D of Z then which of the following is true:-

- $\frac{\partial u}{\partial x}=\frac{\partial v}{\partial y}$ and $\frac{\partial u}{\partial y}=-\frac{\partial v}{\partial x}$
- $\frac{\partial u}{\partial x}=\frac{\partial v}{\partial x}$ and $\frac{\partial u}{\partial y}=\frac{\partial v}{\partial y}$
- $\frac{\partial u}{\partial x}=\frac{\partial v}{\partial y}$
- $\frac{\partial u}{\partial x}=\frac{\partial v}{\partial y}$

10 of 100

107 PU_2016_307

A field F is irrotational if:-

- curl F = 0
- grad F = 0
- div F = 0
- none of these

11 of 100

123 PU_2016_307

If g is a function defined on the open interval (a, b) such that a<g(x)<x for all x ∈ (a, b) then g is:-

- a non-negative function
- a non-constant function
- An unbounded function
- a strictly increasing function

12 of 100

131 PU_2016_307

Which of the following is a linear differential equation:-

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

13 of 100

127 PU_2016_307

If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and a+d=1 and ad-bc=1 then A^3 equals:-

- 0
- 3I
- I
- none of these

14 of 100

138 PU_2016_307

Let C be the contour $|z| = 2$ oriented the anti-clockwise direction. The value of the integral $\oint_C ze^{3/z}dz$ is:-

- 5πi
- 9πi
- 7πi
- 3πi

15 of 100

117 PU_2016_307

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

- Orthogonal
- Unitary
- hermitian
- skew hermitian

16 of 100

113 PU_2016_307

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

- {±*i* ; ±1}
- {*±1}*
- {0,±*i* }
- {±*i* }

17 of 100

105 PU_2016_307

For XOR operator ⊕ which one is not correct?

- $1 \oplus 0 = 1$
- $0 \oplus 0 = 1$
- $0 \oplus 1 = 1$
- $1 \oplus 1 = 0$

18 of 100

133 PU_2016_307

$y=x^{-n}$ where n is a positive integer represents:-

- straight line
- ellipse
- parabola
- hyperbola

19 of 100

109 PU_2016_307

The volume of the parallelepiped 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:-

- 28
- 7
- 6
- 15

20 of 100

101 PU_2016_307

A student is to answer 10 out of 13 questions in an examination such that he must choose at least 4 from the first five questions. The number of ways he can choose the question is:-

- 196
- 280
- 140
- 346

21 of 100

161 PU_2016_307

The point group symmetry of the staggered form of ethane molecule is:-

- D_{3d}
- D_{3h}
- D_3
- C_{3v}

22 of 100

171 PU_2016_307

Which among the following will be paramagnetic?

- $V(CO)_6$
- $Cr(CO)_6$
- $Fe(CO)_5$
- $Fe2(CO)_9$

23 of 100

145 PU_2016_307

Any substance which completely destroys or reduces the activity of the catalyst is called:-

- Catalyst
- Inhibitor
- Catalyst poison
- Promoter

24 of 100

153 PU_2016_307

The oxidation state of Cr in CrO_5 is:-

- +2
- +10
- +4
- +6

25 of 100

169 PU_2016_307

IUPAC name of $[Pt(NH_3)_3(Br)(NO_2)Cl]Cl$ is:-

- Triamminenitrochlorobromo platinum (IV) chloride
- Bromochloro nitrotriammine platinum (IV) chloride
- Triamminebromo chloronitro platinum (IV) chloride
- Triamminechloro bromonitro platinum (IV) chloride

26 of 100

143 PU_2016_307

The compound $YBa_2Cu_3O_7$ is used as:-

- Superconductor
- Super-cooled material
- Semiconductor
- Dielectric

27 of 100

167 PU_2016_307

In second order reaction A → B, if the concentration of A is doubled, the half-life of the reaction will be:-

- Halved
- Unchanged
- Quadrupled
- Doubled

28 of 100

147 PU_2016_307

The Bragg condition is:-

- $\sin\theta = n\lambda$
- $d\sin\theta = 2\lambda$
- $\sin\theta = \lambda/d$
- $2d\sin\theta = n\lambda$

29 of 100

179 PU_2016_307

Which of the following statement is true for electrochemical cells?

- H_2 is anode and Cu is electrode
- Reduction occurs at H_2 electrode
- H_2 is cathode and Cu is anode
- oxidation occurs at Cu electrode

30 of 100

141 PU_2016_307

Sea water will boil at a temperature_____.

- Same as that of pure water
- Higher than pure water
- Lower than pure water
- Cannot be predicted

31 of 100

177 PU_2016_307

How many NMR signals are formed in cis-dimethyl cyclopropane and transdimethyl cyclopropane:-

- 1,2
- 3,4
- 8,10
- 2,3

32 of 100

175 PU_2016_307

In the Boat conformation of cyclohexane the most destabilizing interaction is:-

- Eclipsing
- Flagpole-Flangpole
- 1,3 - diequatorial
- 1,3 - diaxial

33 of 100

155 PU_2016_307

The complexes $[Co(H_2O)_4Cl_2]NO_2$and $[Co(H_2O)_4Cl(NO_2)]Cl$ are:-

- optical isomers
- linkage isomers
- ionization isomers
- positional isomers

34 of 100

157 PU_2016_307

Atoms of different elements containing the same number of neutrons but different number of total nucleons is known as:-

- Isodiaphers
- Isotones
- Isotopes
- Isosterism

35 of 100

173 PU_2016_307

BF_3 is used as a catalyst in several industrial processes due to:-

- Weak Lewis acid character
- Strong reducing nature
- Strong Lewis acid nature
- Weak reducing action

36 of 100

163 PU_2016_307

PF3 belongs to the point group:-

- D_{2d}
- C_{3v}
- D_{3h}
- D_{2h}

37 of 100

149 PU_2016_307

Borax is used in preparing:-

- Portland cement
- Soda glass
- Pyrex glass
- Opal glass

38 of 100

151 PU_2016_307

Mossbauer effect is also related with resonance fluorescence of:-

- Beta rays
- Alpha rays
- Gamma rays
- X-rays

39 of 100

165 PU_2016_307

In the reaction $KIO_3 + 5KI + 6HCl \longrightarrow 3I_2 + 6KCl + 3H_2O$:-

- KI is reduced to I_2
- KIO_3 is reduced to I_2
- KIO_3 is oxidised to I_2
- None of the above

40 of 100

159 PU_2016_307

Which among the following is not true for electrochemical cell?

- It consists of a battery
- Anode acquires negative charge
- It consists of generally two electrolytes
- It needs a porous partition

41 of 100

203 PU_2016_307

In LASER, at threshold condition:-

- Stimulated emission is dominant over illumination
- Stimulated emission is dominant over resistance
- Stimulated emission is dominant over absorption
- Stimulated emission is dominant over spontaneous emission

42 of 100
183 PU_2016_307
Atomic bonding is established due to:-

- gravitational force
- electrostatic force
- magnetic force
- nuclear force

43 of 100
215 PU_2016_307
The Young's modulus is obtained from the ratio between:-

- Strain and the length
- Strain and elongation
- Strain and the stress
- Strain and the diameter

44 of 100
197 PU_2016_307
Alpha decay of an atom/isotope results the loss of:-

- Two neutrons
- Two protons and two neutrons
- Two Electrons
- Two photons

45 of 100
191 PU_2016_307
The potential barrier at P-N junction arises due to:-

- minority carriers
- majority carriers
- both majority and minority carriers
- Fixed donor and acceptor concentration

46 of 100
205 PU_2016_307
A tunnel diode is fabricated using:-

- Intrinsic semiconductor
- Shallow doped pn junction
- Heavily doped pn junction
- A high resistive pn junction

47 of 100
217 PU_2016_307
The value of solar constant is:-

- 1.36 J/ m^2-s
- 1.36 KW/m^2-s
- 1.36 W/ m^2-s
- 1.46 KW/ m^2-s

48 of 100
219 PU_2016_307
The ratio of the charge sensitivity and the current sensitivity of a ballistic galvanometer is:-

- T/2π
- 2π/T
- ½π
- 2

49 of 100
187 PU_2016_307
The magnetization of a superconductor is:-

- -H
- 0
- -1
- -B

50 of 100
181 PU_2016_307
The effective mass of an electron in a semiconductor can be:-

- negative near the bottom of the band
- zero at the centre of the band
- A scalar quantity with a small magnitude
- negative near the top of the band

51 of 100
185 PU_2016_307
The decrease in free energy during recrystallization originates mainly from:-

- lower energy of the new crystal structure
- grain boundaries
- excess dislocations
- excess point defects

52 of 100

189 PU_2016_307

The temperature of the antiferromagnetic-to-paramagnetic transition is called:-

- Debye temperature
- Curie-Weiss temperature
- Neel temperature
- antiferromagnetic Curie temperature

53 of 100

209 PU_2016_307

Device isolation in an integrating Circuit fabrication is achieved using:-

- SiO_2 deposition
- Etching
- Metalization
- Photomasking

54 of 100

211 PU_2016_307

Improper biasing to the Transistor circuit leads to:-

- Heavy loading of the emitter terminal
- Distortion in the output signal
- Faulty location of the load line
- Excess heat production at the collector terminal

55 of 100

213 PU_2016_307

When a body is thrown, the horizontal range of projectile 'R" can be defined as:-

- R = (u. Sin2θ)/g
- R = (2u. Sin2θ)/g
- R = (2g. Sin2θ)/g
- R = (uv. Sin2θ)/g

56 of 100

195 PU_2016_307

NAND gate does the function of:-

- Subtraction
- Addition
- Inversion
- Multiplication

57 of 100
199 PU_2016_307
Acceleration "f" of a charge "q" caused by an applied electric field "E" is defined as:-

- f = μm* E/q
- f = μE/q
- f = q E/ m*
- f = m* E/q

58 of 100
193 PU_2016_307
Electric motor works under the:-

- Fleming's Right hand rule
- Faraday's rule
- Fleming's left hand rule
- Einstein's rule

59 of 100
207 PU_2016_307
The trans-conductance "g" of JFET is equal to:-

- $[2/|V_p|]\sqrt{(I_{DSS} * I_D)}$
- $[I_{DSS}/V_p]\{1-(V_{GS}/V_p)\}$
- $[-2/V_p]\{1-(V_{GS}/V_p)\}$
- $-2I_{DSS}/V_p$

60 of 100
201 PU_2016_307
The angular frequency of rotation (ω_c) upon interaction between electron and magnetic field without collision is:-

- $\omega_c = \sigma eB/m^*$
- $\omega_c = eB/m^*$
- $\omega_c = B/m^*e$
- $\omega_c = \sigma m^*/B$

61 of 100
253 PU_2016_307
Electron acceptor in Photosystem II is:-

- Ferredoxin
- Quinone
- Plastoquinone
- Cytochrome

62 of 100
251 PU_2016_307
Kinases carry out:-

- Removal of phosphates
- Phosphorylation
- Transfer of galactose
- Hydrolysis

63 of 100
231 PU_2016_307
Which of the following is a termination codon in a polypeptide synthesis?

- AUG
- UAA
- GUG
- UGG

64 of 100
257 PU_2016_307
Which one of the following amino acid is represented by single codon?

- Valine
- Lysine
- Proline
- Methionine

65 of 100
241 PU_2016_307
The following is a plant growth regulator used for quick ripening of fruit:-

- Ethylene
- Butylene
- Auxin
- Insulin

66 of 100
237 PU_2016_307
In the absence of molecular oxygen as in the skeletal muscles, pyruvate is converted into:-

- Acetic Acid
- Formic Acid
- Lactic Acid
- CO_2

67 of 100
227 PU_2016_307
Point Mutations are due to:-

- Changes in normal arrangement of gene in a chromosome
- Changes in number of chromosomes
- Gross changes in chromosomes
- Changes in nucleotide sequence of a gene

68 of 100
249 PU_2016_307
Enzymes that catalyses the linkage of molecule by splitting a phosphate bond is:-

- Isomerase
- Ligase
- Lysase
- Transferase

69 of 100
259 PU_2016_307
Growing plants from its parts such as leaf, stem, root is termed as:-

- Vegetative propagation
- Cloning
- Seedless culture
- Non-vegetative propagation

70 of 100
233 PU_2016_307
Percentage of light energy utilized in photosynthesis is generally around:-

- 90%
- 50%
- 10%
- 1%

71 of 100
235 PU_2016_307
Auxins inhibits the growth of:-

- Parthinocarpic development of fruits
- Roots
- Lateral axillary buds
- Apical buds

72 of 100
245 PU_2016_307
HCFC is an eco-friendly gas and it differs from CFC by:-

- The deletion of CO from CFC
- Nitrous oxide
- By the addition of chlorine to CFC
- The loss of chlorine and bromine

73 of 100
229 PU_2016_307
What can happen when wheat field is inoculated with Rhizobium?

- Increase in production/ nitrogen content of the soil
- Fertility of the soil decreases
- No increase in production/ nitrogen content of the soil
- Fertility of the soil increases

74 of 100
255 PU_2016_307
Which of the following is correct for B-DNA?

- It has no helical sense
- It has no phosphate backbone
- It has right-handed helical sense
- It has left-handed helical sense

75 of 100
243 PU_2016_307
Which of the following is not a vitamin?

- Riboflavin
- Folic Acid
- Formic Acid
- Ascorbic Acid

76 of 100
225 PU_2016_307
The correct sequence of mitosis in an animal cell is:-

- Interphase, Metaphase, Prophase, Anaphase, Telophase
- Metaphase, Anaphase, Prophase, Interphase, Telophase
- Prophase, Interphase, Anaphase, Metaphase, Telophase
- Interphase, Prophase, Metaphase, Anaphase, Telophase

77 of 100
239 PU_2016_307
Which of the following protein acts as an energy transduer?

- Hemoglobin
- Bacteriorhodopsin
- Heat shock protein
- G-protein

78 of 100
247 PU_2016_307
Internal phosphodiester bond in a nucleic acid molecule is hydrolysed by:-

- DNA polymerase
- Endonuclease
- deoxyribonuclease
- Exonuclease

79 of 100
221 PU_2016_307
Which side of t-RNA molecule hydrogen bonds to mRNA molecule?

- 3' end of t-RNA molecule
- 5' end of t-RNA molecule
- Anticodon
- Codon

80 of 100
223 PU_2016_307
Okazaki fragment relate to:-

- Partially synthesized mRNA
- DNA Primers for leading strand synthesis
- SiRNA fragments
- DNA fragment that help synthesis of lagging strand

81 of 100
263 PU_2016_307
Log mean temperature difference in case of counter flow compared to parallel flow heat exchanger will be:-

- less
- same
- more

- depends on other factors

82 of 100

275 PU_2016_307

The rate of conductive heat transfer across $1m^2$ of a mild steel plate that has a constant thickness of $5x10^{-3}m$ and a thermal conductivity of 45 W/mK, when the temperature of hot and cold surfaces are 100 °C and 99.9 °C, is:-

- 90 W
- 9 W
- 900 W
- 0.007 W

83 of 100

271 PU_2016_307

An engine working on carnot cycle rejects 40% of absorbed heat from the source, while the sink temperature is maintained at 27°C, then what is the source temperature?

- 477°C
- 67.5°C
- 750°C
- 203°C

84 of 100

289 PU_2016_307

In an axial flow impulse turbine, energy transfer takes place due to:-

- change in absolute kinetic energy
- change in pressure energy
- change in relative kinetic energy
- change in energy balance because of centrifugal force

85 of 100

281 PU_2016_307

The thermal efficiency of a carnot heat engine is 30%. If the engine is reversed in operation to work as a heat pump with operating conditions unchanged, then what will be the COP for heat pump?

- 0.33
- 0.30
- 2.33
- cannot be calculated

86 of 100

273 PU_2016_307

In a throttling process, which one of the following parameters remains constant?

- entropy

- enthalpy
- temperature
- pressure

87 of 100

283 PU_2016_307

In a psychrometric chart, what does a vertical downward line represent?

- dehumidification process
- sensible cooling process
- humidification process
- adiabatic saturation process

88 of 100

269 PU_2016_307

The refrigerant for a refrigerator should have:-

- high latent heat
- high total heat
- low latent heat
- high sensible heat

89 of 100

298 PU_2016_307

A metal plate has a surface area of 2 m^2, thickness 10 mm and a thermal conductivity of 200 W/m K. What is the thermal resistance of the plate?

- 2.5×10^{-3} K/W
- 2.5×10^{-5} K/W
- 4×10^{4} K/W
- 1.5×10^{-5} K/W

90 of 100

299 PU_2016_307

A 3 m wide rectangular channel carries 15 m^3/sec of water. Its critical depth is equal to:-

- 2m
- 1.6m
- 1m
- 1.5m

91 of 100

287 PU_2016_307

Which one of the following metal forming processes is not a high energy rate forming process?

- Electro-magnetic forming
- Roll-forming
- Electro-hydraulic forming
- Explosive forming

92 of 100

261 PU_2016_307

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

- decreases
- increases
- remains constant
- unpredictable

93 of 100

279 PU_2016_307

The vanes of a centrifugal pump are generally:-

- Curved backward
- Twisted
- Radial
- Curved forward

94 of 100

291 PU_2016_307

The power absorbed by hydraulic pump is directly proportional to which one of the following?

- N
- N^4
- N^3
- N^2

95 of 100

265 PU_2016_307

The vapour pressure of refrigerant should be:-

- equal to atmospheric pressure
- lower than atmospheric pressure
- higher than atmospheric pressure
- could be anything

96 of 100

285 PU_2016_307

Which thermodynamic property is evaluated with the help of Maxwell equations from the data of other measurable properties of steam?

- Entropy
- Enthalpy
- Specific heat
- Latent heat

97 of 100

267 PU_2016_307

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

- plate type
- shell and tube type
- double pipe type with fins on steam side
- double pipe type with fins on air side

98 of 100

296 PU_2016_307

A three phase 6 pole 50 HZ induction motor is running at 5% slip. What is the speed of the motor?

- 850 rpm
- 1000 rpm
- 900 rpm
- 950 rpm

99 of 100

294 PU_2016_307

A gas turbine plant working on Joule cycle produces 4000 kW of power. If its work ratio is 40%, what is the power consumed by compressor?

- 8000 KW
- 2000 KW
- 6000 KW
- 4000 KW

100 of 100

277 PU_2016_307

The value of solar constant is:-

- 1637 W/m^2
- 1763 W/m^2
- 1000 W/m^2
- 1367 W/m^2

PU M Tech Green Energy Technology

1 of 100
196 PU_2015_307
Enzyme that is involved in the interconversion of relaxed and supercoil DNA is:-

- Exonuleases
- RNA Polymerases
- Topoisomerases
- DNA Polymerases

2 of 100
133 PU_2015_307
A unit matrix of order n is of rank:-

- n
- 1
- 2n
- 0

3 of 100
168 PU_2015_307
Aluminum is obtained from alumina by:-

- Reduction with zinc
- Reduction with carbon
- Electrolytic reduction
- None

4 of 100
181 PU_2015_307
How many number bacteria are there in 0.1µl of 106 cells/ml of culture?

- 100
- 10
- 1000
- 1

5 of 100
166 PU_2015_307
The transition metal present in vitamin B-12 is:-

- Fe
- Cu
- Co
- None

6 of 100

177 PU_2015_307

Which of the following molecules show EPR resonance?

- H_2O
- H_2O_2
- O_2
- CO_2

7 of 100

120 PU_2015_307

The quadratic equation $4kx^2-8x+k=0$ has equal roots. Then the value of k is:-

- 2
- 4
- 1
- 0.5

8 of 100

144 PU_2015_307

Oxidation number of Fe in Fe_3O_4 is:-

- 4/3
- 8/3
- 5/3
- 2/3

9 of 100

118 PU_2015_307

Solution of the differential equation

$$\frac{d^2x}{dy^2}+x=0,\quad x=0\quad at\quad y=0\quad and\quad x=1\quad at\quad y=\pi/2$$

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

10 of 100

215 PU_2015_307

A true breeding tall plant is crossed with a true breeding short plant and the F_1 generation produced is self-pollinated to produce F_2 generation. Ratio of true breeding tall and true breeding short plant in F_2 generation will be:-

- 1 : 1
- 1 : 2

- 2 : 1
- 1 : 3

11 of 100

145 PU_2015_307

Which of the following is paramagnetic?

- $[Cr(CO)_6]$
- $[Fe(CO)_6]$
- $[Ni(CO)_6]$
- $[V(CO)_6]^+$

12 of 100

180 PU_2015_307

Thermophile bacteria that grow in the temperature range of:-

- 30 °C to 75 °C ;
- 15 °C to 45 °C ;
- -10 °C to 20 °C ;
- Above 100 °C.

13 of 100

162 PU_2015_307

Which of the following molecules will have a permanent dipole moment?

- XeF_4
- BF_3
- SiF_4
- SF_4

14 of 100

210 PU_2015_307

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

- Protease
- Zymase
- Cellulase
- Lipase

15 of 100

127 PU_2015_307

The function f(z) = is differentiable at:-

- i
- -I
- -1
- 1

16 of 100

114 PU_2015_307

For all real numbers x, y the expression $\frac{x+y+|x-y|}{2}$ is equal to (*)

- $|x+y|$
- The average of $|x|$ and $|y|$
- the maximum of x and y
- the minimum of x and y

17 of 100

176 PU_2015_307

If ΔG° is zero for a reaction, then:-

- ΔH = 0
- k = 1
- ΔS = 0
- k (equilibrium constant) = 0

18 of 100

208 PU_2015_307

The absorption maxima of chlorophyll in PhotoSystemII is:-

- 700nm
- 600nm
- 680nm
- 780nm

19 of 100

169 PU_2015_307

Density Of States (DOS) is maximum for:-

- Quantum rod
- Quantum well
- Quantum dot
- Quantum wire

20 of 100

206 PU_2015_307

Which of the following is not a restriction endonuclease?

- Eco R1
- DNA Ligase
- Bam H1
- Hind III

21 of 100

134 PU_2015_307

For a system of m linear equations in n unknowns, the Cramer's rule is applicable when:-

- m=n
- m=n and the coefficient matrix is non-singular
- m≠nand the coefficient matrix is non-singular
- m≠n

22 of 100

179 PU_2015_307

A silver cube having edge size 1 mμ was subdivided into 10 nm silver cubes. The surface to volume ratio is expected to:-

- Decrease
- Unaltered
- Increase
- Unity

23 of 100

131 PU_2015_307

A skew symmetric matrix cannot be of rank:-

- 1
- greater than 1
- 0
- -1

24 of 100

124 PU_2015_307

If g is a function defined on the open interval (a.b) such that a<g(x)<x for all$x \in (a,b)$ ther

- An unbounded function
- a strictly increasing function
- a non-negative function
- a non-constant function

25 of 100

188 PU_2015_307

Beta sheets in a protein are formed due to:-

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

26 of 100

173 PU_2015_307

The structure of O_3 and N_3- are:-

- bent and linear, respectively
- Linear and bent, respectively
- both bent
- both linear

27 of 100

139 PU_2015_307

For joint probability P(A ∩ B) for two events A and B:-

- $P(A \cap B) = P(A)P(B) - P(A \cup B)$
- $P(A \cap B) = P(A) + P(B)$
- $P(A \cap B) = P(A) + P(B) - P(A \cup B)$
- $P(A \cap B) = P(A) + P(B) + P(A \cup B)$

28 of 100

102 PU_2015_307

If $A = \begin{bmatrix} 1 & 0 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix}$ then A^{50} is

- $\begin{bmatrix} 1 & 0 & 0 \\ 25 & 1 & 0 \\ 25 & 0 & 1 \end{bmatrix}$
- $\begin{bmatrix} 1 & 0 & 0 \\ 50 & 1 & 0 \\ 50 & 0 & 1 \end{bmatrix}$
- $\begin{bmatrix} 1 & 0 & 0 \\ 48 & 1 & 0 \\ 48 & 0 & 1 \end{bmatrix}$
- $\begin{bmatrix} 1 & 0 & 0 \\ 24 & 1 & 0 \\ 24 & 0 & 1 \end{bmatrix}$

29 of 100

189 PU_2015_307

Waxes are:-

- Saturated long chain hydrocarbons
- Lipids with long chain carbohydrates
- Ether link of long chain fatty acid with long chain alcohol
- Lipids with a polypeptide linkage

30 of 100

178 PU_2015_307

What among following is used to produce artificial rain?

- carbon monoxide
- copper oxide
- silver iodide
- silver nitrate

31 of 100

130 PU_2015_307

If there exist a non-zero minor of order r, then rank of A is:-

- greater than or equal to r
- Equal to r
- less than r
- less than or equal to r

32 of 100

152 PU_2015_307

The point group symmetry of H_2S molecule is:-

- D_{3h}
- C_{2v}
- C_{1v}
- C_{2v}

33 of 100

182 PU_2015_307

Which of the following is the perfect ligand for avidin?

- streptavidin;
- IP3
- nicotine;
- biotin;

34 of 100

175 PU_2015_307

Osmimum tetroxide is a reagent used for:-

- Hydroylation of acetylene
- Hydroxylation of olefins to give trans diols
- Hydroxylation of carbonyl compounds
- Hydroxylation of olefins to give cis diols

35 of 100

137 PU_2015_307

The equation of a straight line that passes through point A(1,-1) and has a slope equa to -1 is:-

- y=x+1
- y=x
- y=1/x
- y=-x

36 of 100

143 PU_2015_307

In the exothermic reaction, the enthalpy of a reaction is always:-

- Positive
- Zero
- Negative
- All

37 of 100

129 PU_2015_307

Let $X=\begin{bmatrix}2 & 0 & -3\\ 3 & -1 & -3\\ 0 & 0 & -1\end{bmatrix}$. A matrix P such that $P^{-1}XP$ is a diagonal matrix is

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

38 of 100

138 PU_2015_307

Root of the equation $x^2+ix+2=0$, where $i=\sqrt{-1}$ is:-

- (-1, 1)
- (-2i, i)
- (i, 1)
- no root exist

39 of 100

172 PU_2015_307

The structure of NaCl is:-

- Cubic
- Trigonal
- Monoclinic
- Triclinic

40 of 100

135 PU_2015_307

Derivative of $y=2^x$ is:-

- $\frac{dy}{dx} = -x2^{x-1}$
- $\frac{dy}{dx} = \frac{2^{x-1}}{x}$
- $\frac{dy}{dx} = 2.3\log 2.2^x$
- $\frac{dy}{dx} = x\,2^{x-1}$

41 of 100

123 PU_2015_307

A drawn contains 2 blue, 4 red, and 2 yellow socks. If 2 socks are to be randomly selected from the drawer, what is the probability that they will be same color?

- 2/7
- 3/5
- 3/7
- 2/5

42 of 100

117 PU_2015_307

When two vectors A(i) and B(j) are orthonormal then:-

- A(i).B(j) = 0
- A(i).B(j) = 1
- A(i).B(j) = δij
- none of the above

43 of 100

186 PU_2015_307

RNA Polymerase is an enzyme that:-

- Translate RNA
- Transcribe DNA

- Replicate DNA
- Replicate RNA

44 of 100

148 PU_2015_307

The bond order of C_2 molecule is:-

- 0
- 3
- 2
- 1

45 of 100

142 PU_2015_307

For a spontaneous reaction:-

- ΔG = -ve
- ΔG = +ve
- ΔG = 0
- None

46 of 100

174 PU_2015_307

The number of orbitals present in the n = 4 atomic shell is:-

- 32
- 8
- 16
- 64

47 of 100

126 PU_2015_307

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

- has a slope -1
- Passes through x=0, y=0
- has a slope +1
- is parallel to the x-axis

48 of 100

147 PU_2015_307

The 'd' orbital which has the maximum electronic probability electron density lying along two axis is known as:-

- dx
- dx^2-y^2

- dx^2
- dxy

49 of 100

141 PU_2015_307

The planar geometry is exhibited by:-

- CO_3^{2-}
- NI_3
- PF_5
- ClO_4-

50 of 100

146 PU_2015_307

Which one of the following high-spin complexes has the highest CFSE?

- $[Cr(H_2O)6]^{2+}$
- $[Mn(H_2O)6]^{3+}$
- $[Mn(H_2O)6]^{2+}$
- $[Cr(H_2O)6]^{3+}$

51 of 100

153 PU_2015_307

A Carnot engine operates between 600 and 800K, and observes 2000 calories heat from the source. The work done (in cal) is:-

- 2000
- 666
- 1000
- 500

52 of 100

192 PU_2015_307

End-to-end length of a bacteriophage DNA having 48kbp is:-

- 150µm
- 15.4µm ;
- 1.54µm ;
- 1.50µm;

53 of 100

184 PU_2015_307

Autotrophic microbes:-

- Releases CO_2 ;
- Fixes O_2

- Fixes CO_2 ;
- Releases O_2 ;

54 of 100

121 PU_2015_307

The remainder when $2x^3+x^2-1$ is divided by (x-2) is:-

- 9
- 5
- 19
- -13

55 of 100

170 PU_2015_307

The metal used in storage battery is:-

- Pt
- Pb
- Ag
- Au

56 of 100

132 PU_2015_307

If $A = \begin{bmatrix} 5 & 0 & 2 \\ 0 & 1 & 0 \\ -4 & 0 & -1 \end{bmatrix}$ and I be 3x3 unit matrix, If M=I-A, then rank of I-A is

- 3
- 2
- 0
- 1

57 of 100

219 PU_2015_307

Which of the following is a green house gas?

- SO_2
- NO_2
- CO
- CO_2

58 of 100

100 PU_2015_307

If D_x and D_y represents the partial derivative operators, then the expression $\frac{1}{D_x^2-D_y^2}\sin(x-y)$ *is* equal to:-

- $-\frac{x}{2}\cos(x-y)$

- $-\frac{x}{2}\sin(x-y)\cos(x-y)$
- $-\frac{x}{2}\cos(x-y)+\sin(x-y)$
- $\frac{3x}{2}\sin(x-y)$

59 of 100
195 PU_2015_307
Chloroflorocarbon in the atmosphere causes depletion of:-

- Carbondioxide
- Nitrogen
- Oxygen
- Ozone

60 of 100
163 PU_2015_307
One of the following molecules used as food preservatives is:-

- Ethylene glycol
- Sodium alkyl benzene sulphonate
- Sodium benzoate
- None

61 of 100
238 PU_2015_307
In a refrigerator the heat exhausted to the outer atmosphere is:-

- Same as that absorbed from the contents
- More than that absorbed from the contents
- Less than that absorbed from the contents of the refrigerator
- Any of the above depending upon the working substance

62 of 100
239 PU_2015_307
In a heat engine the maximum heat that can be converted into mechanical work:-

- Depends upon working temperatures
- Depends upon friction
- Depends upon the working
- Is 100%

63 of 100
248 PU_2015_307
The area of the Carnot cycle on a T-S diagram represents:-

- Heat rejected to the sink

- Efficiency of the engine
- Work done in a cycle
- Heat absorbed from the source

64 of 100

258 PU_2015_307

When a voltmeter is placed across a forward biased diode, it will read a voltage approximately equal to:-

- The diode barrier potential
- 0V
- The bias battery voltage
- The total circuit voltage

65 of 100

246 PU_2015_307

At 0 K fluids are assumed to have:-

- Minimum entropy
- Zero entropy
- Fixed value of entropy
- Maximum entropy

66 of 100

255 PU_2015_307

The depletion region is created by:-

- Diffusion
- Recombination
- Ionization
- All of these

67 of 100

242 PU_2015_307

Critical temperature is defined as the:-

- Highest temperature at which the gas can be liquefied at constant pressure
- Lowest temperature at which the gas can be liquefied at constant pressure
- Lowest temperature at which the gas can be liquefied by increase of pressure alone
- Highest temperature at which the gas can be liquefied by increase of pressure alone

68 of 100

232 PU_2015_307

The path of the particles for a motion in a uniform electric field is:-

- Parallel
- Circular

- Parabola
- Perpendicular

69 of 100

225 PU_2015_307

The Poisson's equation in CGS Gaussian system is:-

- $\nabla^2 V = \frac{-\rho}{\epsilon_o}$
- $\nabla^2 V = -4\pi\sigma$
- $\nabla^2 V = -4\pi\rho$
- $\nabla^2 V = 0$

70 of 100

224 PU_2015_307

The electrical field intensity on the surface of a charged conductor is:-

- Directed tangentially to the surface
- Zero
- Directed along 45° to the surface
- Directed normally to the surface

71 of 100

259 PU_2015_307

Load regulation is determined by:-

- Changes in load resistance and input voltage
- Changes in load current and input voltage
- Changes in load current and output voltage
- Changes in zener current and load current

72 of 100

254 PU_2015_307

A better power supply should possess:-

- Lower output impedance
- Higher input impedance
- Total voltage regulation
- Lower input impedance

73 of 100

230 PU_2015_307

The electric and magnetic fields share the energy of electromagnetic wave in the ratio:-

- 1:1

- 2:1
- 1:2
- 1:4

74 of 100

237 PU_2015_307

The device which converts heat into mechanical work is:-

- Motor
- Genertaor
- Heat Engine
- Energy converter

75 of 100

223 PU_2015_307

Quantum dot is referred as:-

- One dimensional structure
- Zero dimensional structure
- Z-dimensional structure
- Two dimensional structure

76 of 100

234 PU_2015_307

A quarter-wave transformer matching a 75Ω source with a 300 Ω load should have a characteristic impedance of :-

- 150Ω
- 50Ω
- 100Ω
- 200Ω

77 of 100

235 PU_2015_307

A cavity resonator can be represented by:-

- A lossy capacitor
- A lossy inductor
- An LC circuit
- An LCR circuit

78 of 100

221 PU_2015_307

The refractive index of material is the ratio:-

- Speed of light in vacuum/ speed of light in material
- Speed of sound/ Speed of light

- Speed of light in vacuum/ speed of light in air
- Speed of light in water/ speed of light in air

79 of 100

251 PU_2015_307

The temperature at which a gas liquefies is called:-

- Critical temperature
- Boiling point
- Melting point
- Boyle's temperature

80 of 100

222 PU_2015_307

Optical cavity in LASERS used to obtain:-

- Radiated emission
- Stimulated emission
- Spontaneous emission
- Excited emission

81 of 100

275 PU_2015_307

The maximum demand of a consumer is 2 KW and the corresponding daily energy consumption is 30 units. What is the corresponding load factor?

- 50%
- 62.5%
- 75%
- 25%

82 of 100

292 PU_2015_307

The parameters used by *American Society of Mechanical Engineers (ASME)* to define fans, blowers and compressors is _____.

- specific ratio
- twist factor
- blade ratio
- fan ratio

83 of 100

288 PU_2015_307

Which one of the following is correct for a selective surface for solar thermal applications?

- High absorptivity and high emissivity
- Low absorptivity and low emissivity
- High absorptivity and low emissivity

- Low absorptivity and high emissivity

84 of 100

262 PU_2015_307

Which of the following does not represent the important quality of CI engine fuel?

- Viscosity
- Anti-knock quality
- Ignition quality
- Volatility

85 of 100

291 PU_2015_307

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

- gas and gas or liquid and gas
- liquid and evaporating fluid
- liquid and liquid
- condensing fluid and liquid

86 of 100

267 PU_2015_307

When heat is transferred by molecular collision, it is referred to as heat transfer by:-

- Convection
- Radiation
- Scattering
- Conduction

87 of 100

260 PU_2015_307

Bernoulli's equation describes:-

- Kinetic energy balance in turbulent flow
- Mechanical energy balance in boundary
- Kinetic energy balance in laminar flow
- Mechanical energy balance in potential flow

88 of 100

294 PU_2015_307

Latent heat of steam with increase of pressure:-

- increases
- remains same
- decreases
- behaves unpredictably

89 of 100
276 PU_2015_307
Which one of the following materials is a sensible heat storage material?

- Servotherm
- Lauric acid
- Acetamide
- Capric acid

90 of 100
299 PU_2015_307
If the temperature of a solid surface changes from 27°C to 627°C, then its emissive power changes at which ratio?

- 6:1
- 27:1
- 9:1
- 81:1

91 of 100
284 PU_2015_307
Which one of the following is not a ceramic?

- Whisker
- Alumina
- Pyrosil
- Porcelai

92 of 100
296 PU_2015_307
In a vapour compression refrigeration plant, the refrigerant leaves the evaporator at 195 kJ/kg and the condenser at 65 kJ/kg. For 1 kg/s of refrigerant, what is the refrigeration effect?

- 100 KW
- 70 KW
- 160 KW
- 130 KW

93 of 100
270 PU_2015_307
One ton refrigeration is equal to:-

- 3402 Kcal/hr
- 4302 Kcal/hr
- 3204 Kcal/hr
- 3024 Kcal/hr

94 of 100
280 PU_2015_307
The ratio of inertia force and surface tension force is referred to as:-

- Froude number
- Mach number
- Weber number
- Pressure coefficient

95 of 100
261 PU_2015_307
Air is best heated with steam in a heat exchanger of:-

- Shell and tube type
- Double pipe type with fins on steam side
- Plate type
- Double pipe type with fins on air side

96 of 100
278 PU_2015_307
Property of a fluid by which its own molecules are attracted is called:-

- Adhesion
- Compressibility
- Viscosity
- Cohesion

97 of 100
268 PU_2015_307
In free convection heat transfer, Nusselt number is function of:-

- Grashoff no. and Reynol d no.
- Grashoff no., Prandtl no. and Reynol d no
- Prandtl no. and Reynol d no.
- Grashoff no. and Prandtl no.

98 of 100
279 PU_2015_307
Log mean temperature difference in case of counter flow compared to parallel flow heat exchanger will be:-

- more
- less
- same
- depends on other factors

99 of 100

281 PU_2015_307

Which of the following is not the property of the system?

- Internal energy
- Entropy
- Specific heat
- Heat

100 of 100

283 PU_2015_307

Reheating in a multi-stage expansion gas turbine cycle:-

- Improves thermal efficiency
- Improves work ratio
- Avoids pollution
- Reduces compressor work