159 PU Ph D Green Energy Technology

1 of 100
208 PU_2016_159_E
The number of terminal carbonyl groups present in $Fe_2(CO)_9$ is:-

- 3
- 5
- 6
- 2

2 of 100
134 PU_2016_159_E

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

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

3 of 100
143 PU_2016_159_E
Which phenomena causes the polarization of light:-

- Reflection
- Double reflection
- Double refraction
- Diffraction

4 of 100
171 PU_2016_159_E
In XRD analysis, determination of crystalline size is limited by the:-

- Crystalline absorption coefficient
- Lattice points
- Lattice absorption coefficient
- Mass absorption Coefficient

5 of 100
146 PU_2016_159_E
The viscosity of gas is directly proportional to:-

- temperature
- Characteristic gas constant
- square root of temperature
- density of gas

6 of 100

114 PU_2016_159_E

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

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

7 of 100

112 PU_2016_159_E

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:-

- 0
- 3
- 1
- 2

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203 PU_2016_159_E

The emf of a Daniel cell having 0.01 M $CuSO_4$ and 0.2 M $ZnSO_4$ solution at 25°C is:-
(Zn^{2+}/Zn = -0.76 V and Cu^{2+}/Cu = 0.34 V)

- 1.10 V
- -1.032 V
- 1.129 V
- 1.032 V

9 of 100

148 PU_2016_159_E

The diffusion coefficient (D) of atoms with respect to temperature can be defined as:-

- $D = K_o \exp(-\Delta W/KT)$
- $D = T_0 \exp(-\Delta W/KT)$
- $D = W_0 \exp(-\Delta W/KT)$
- $D = D_o \exp(-\Delta W/KT)$

10 of 100

172 PU_2016_159_E

Quantum confinement in solid occurs, when the size shrinks below:-

- Einstein wavelength
- Mean free path
- Green wavelength
- De-Broglie wavelength

11 of 100

190 PU_2016_159_E

The number of unpaired electrons in d^6, low spin octahedral complex is:-

- 4
- 1
- 3
- 0

12 of 100

192 PU_2016_159_E

The compound which obeys 18-electron rule is:-

- $Cr(CO)_6$
- $Mn(CO)_5$
- $V(CO)_6$
- $Fe(CO)_4$

13 of 100

191 PU_2016_159_E

In the following incomplete nuclear equation $^{64}_{29}Cu \longrightarrow ? + {}^{64}_{28}Ni$, the missing term is:-

- A positron
- A neutron
- An electron

- A proton

14 of 100

131 PU_2016_159_E

If f(1) = 2 and f(x) = f(n-1)+1/2 for all integers n>1, then F(101) is (*):-

- 50
- 52
- 49
- 51

15 of 100

103 PU_2016_159_E

The number of ways in which 6 men and 5 women can dine at a round table if no two women are to sit together is:-

- 7!*5!
- 30
- 5!*4!
- 6! *5!

16 of 100

170 PU_2016_159_E

Thermoelectric generator works on the principle of:-

- Meissner effect
- Thompson effect
- Peltier effect
- See beck Effect

17 of 100

164 PU_2016_159_E

The difference between the DC and AC power is arrived using:-

- V^2R
- $Cos\Phi$
- $Cos\omega t$
- $Sin\omega t$

18 of 100

178 PU_2016_159_E

The Load resistance of a Solar cell is defined from the ration between:-

- Maximum output voltage and maximum output voltage
- Maximum output current and the maximum output voltage

- Maximum output voltage and short circuit current
- Output current and the output voltage

19 of 100

133 PU_2016_159_E

$\int_0^1 \frac{x}{1+x^2} dx$ is:-

- π/4
- $log\sqrt{2}$
- log(2)
- 1

20 of 100

176 PU_2016_159_E

A monostable multivibrator circuit:-

- deliver two outputs
- Store energy
- Returns to its stand by state automatically
- Has no stable state

21 of 100

194 PU_2016_159_E

The 'Strainless theory' for the stability of cyclic compounds was postulated by:-

- Sachse-Mohr
- Baeyer
- Ingold
- Robinson

22 of 100

102 PU_2016_159_E

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:-

- 140
- 346
- 280
- 196

23 of 100

141 PU_2016_159_E
The relationship between the orbital quantum number "l" and the azimuthal quantum number n_Φ is:-

- $l = n_\Phi + 1$
- $l = n_\Phi$
- $l = n_\Phi - 1$
- $l = n_\Phi + (1/2)$

24 of 100

116 PU_2016_159_E
Which one is not true for the curve $y = a(x-n)^2$

- horizondal line y = n is an axis of symmetry
- Represent a parabola
- for a > 0 has a minimam y = 0 at x = n
- vertical line x = n is an axis of symmetry

25 of 100

117 PU_2016_159_E
The equation of a straight line that passes through point A(1,-1) and has a slope equation to -1 is:-

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

26 of 100

175 PU_2016_159_E
Isotopes of an atom differ with:-

- Difference in their Protons
- Difference in their Neutrons
- Difference in their electrons
- None of the above

27 of 100

104 PU_2016_159_E
The area of the region bounded by the curves y = |x-2|, x =1, x =3 and the x-axis is:-

- 3
- 2
- 1
- 4

28 of 100

147 PU_2016_159_E
When the acceleration due to gravity at the surface of Earth is "g", the potential energy gain of a mass "m" raised to the radius of the Earth "R" can be:-

- ¼ mgR
- mgR
- 2mgR
- ½ mgR

29 of 100
132 PU_2016_159_E

If $\begin{bmatrix} a & -b \\ b & a \end{bmatrix}$ is invertible under matrix multiplication then its inverse is:-

- $\frac{1}{a^2+b^2}\begin{bmatrix} a & b \\ -b & a \end{bmatrix}$
- $\begin{bmatrix} a & -b \\ b & a \end{bmatrix}$
- $\frac{1}{a^2+b^2}\begin{bmatrix} a & -b \\ b & a \end{bmatrix}$
- $\begin{bmatrix} a & b \\ -b & a \end{bmatrix}$

30 of 100
142 PU_2016_159_E
The resolving power of microscope is :-

- Unlimited
- Limited by the wavelength of light used
- Limited by the diameter of objective lens
- Limited by the kind of glass used

31 of 100
201 PU_2016_159_E
The splitting of energy levels in the presence of an external electric field is_____.

- Zeeman effect
- Kerr effect
- Compton effect
- Stark effect

32 of 100
145 PU_2016_159_E

The angular velocity of the rotating body is,

- $\omega = \theta/t$
- $\omega = \theta/t\sin\theta$
- $\omega = 2\pi r/t$
- $\omega = 2\pi r/ t\sin\theta$

33 of 100

113 PU_2016_159_E

A unit matrix of order n is of rank:-

- 0
- 1
- n
- 2n

34 of 100

144 PU_2016_159_E

The type of wave that carries sound in air is :-

- Transverse wave
- Longitudinal wave
- Electromagnetic wave
- Transverse and longitudinal waves

35 of 100

101 PU_2016_159_E

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

- 5
- 19
- -13
- 9

36 of 100

163 PU_2016_159_E

In Rayleigh scattering is caused by the.:-

- Refraction
- Reflection
- Difference in the Air Mass density
- Flow of wind

37 of 100

200 PU_2016_159_E

Acetylene has the point group:-

- $D_{\infty h}$
- $C_{\infty v}$
- C_{2h}
- C_{2v}

38 of 100

100 PU_2016_159_E

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

- 2
- 0.5
- 4
- 1

39 of 100

149 PU_2016_159_E

In MOSFET, the oxide field strength is defined as:-

- $E(x) = V_G-V_c(x)/t$
- $E(x) = V_s-V_d(x)/t$
- $E(x) = V_d-V_c(x)/t$
- $E(x) = V_d-V_s(x)/t$

40 of 100

205 PU_2016_159_E

Among the following, the complex used for cancer chemotherapy is_____.

- $[Pt(NH_3)_4]^{2+}$
- $[Pt(Cl)_4]^{2-}$
- cis-$[PtCl_2(NH_3)_2]$
- trans-$[PtCl_2(NH_3)_2]$

41 of 100

118 PU_2016_159_E

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

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

42 of 100

111 PU_2016_159_E

A skew symmetric matrix cannot be of rank:-

- 1
- 0
- greater than 1
- -1

43 of 100

110 PU_2016_159_E

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

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

44 of 100

161 PU_2016_159_E

The spontaneous emission in LASER is achieved by:-

- Quantum well layers
- Super lattice
- Optical cavity
- Ohmic contacts

45 of 100

162 PU_2016_159_E

3Dimensional confinement is achieved using:-

- Quantum rod
- Optical cavity
- Quantum Dot
- Quantum Well

46 of 100

115 PU_2016_159_E

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

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

- $\frac{dy}{dx} = \frac{2^{x-1}}{x}$

47 of 100

174 PU_2016_159_E

The difference in carrier density causes:-

- Carrier tunneling
- Carrier drift
- Carrier diffusion
- Carrier recombination

48 of 100

179 PU_2016_159_E

The plants convert the poly sac rides in to cellulose by activating:-

- Covalent bond
- Metallic Bond
- Hydrogen bond
- None of the above

49 of 100

207 PU_2016_159_E

The IUPAC nomenclature of $K[PCl_6]$ is:-

- potassium hexachlorophosphite(V)
- potassium hexachlorophosphate(V)
- potassium hexachlorophosphine(V)
- potassium hexachlorophosphine

50 of 100

204 PU_2016_159_E

Activation energy can be determined from a plot of_____.

- k Vs. (1/T)
- Log k Vs. (1/T)
- k vs. T
- log k Vs. T

51 of 100

202 PU_2016_159_E

The Henderson equation is_____.

- $pH = pK_a + \log[Salt]/[Acid]$
- $pH = pK_a - \log[Salt]/[Acid]$

- pH = -log[H3O+]
- pH = pK_a + log[Acid]/[Salt]

52 of 100

209 PU_2016_159_E

Alkali metals in liquid ammonia are blue in colour because:-

- Solvated electrons
- An ion pair is formed
- The contain alkali metal cations
- An amide ion formed

53 of 100

119 PU_2016_159_E

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

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

54 of 100

130 PU_2016_159_E

If $f(x) = \int_e^x log t \, dt$ for all position x, the $f'(x)$ is:-

- x log(x)
- log (x)
- x
- 1/x

55 of 100

193 PU_2016_159_E

Which of the following does not possess any element of symmetry?

- (+) tartaric acid
- Ethane
- Carbon tetrachloride
- Mesotartaric acid

56 of 100

160 PU_2016_159_E

The refractive index of material is the ratio between:-

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

57 of 100

140 PU_2016_159_E

Raman Effect is due to the collision of ____.

- Photon with Electron
- Electron with atom
- Photon with molecule
- Electron with photon

58 of 100

177 PU_2016_159_E

The sweep speed of a simple RC circuit is given by:-

- I.t/C
- Ts/RC
- V.Ts/RC
- I/C

59 of 100

206 PU_2016_159_E

The elements $_{14}{}^{30}$SI, $_{15}{}^{31}$P, and $_{16}{}^{32}$S are called_____.

- Isotopes
- Isotones
- Isomers
- Isobars

60 of 100

173 PU_2016_159_E

The mean free path (λ) increases with:-

- Increase in pressure
- Increase in collision
- Increase in temperature
- Increase in vacuum

61 of 100

245 PU_2016_159_M

Synthesis of glucose from non-carbohydrate precursors is called:-

- Glycolysis
- Gluconeogenesis
- Glycosylation
- Saccharification

62 of 100

226 PU_2016_159_M

Link between Glycolysis and Kreb Cycle is:-

- Oxaloacetate
- Citric Acid
- Pyruvic Acid
- Acetyle CoA

63 of 100

229 PU_2016_159_M

The species in which the evolutionary process has been influenced by man to meet his needs is called:-

- Adventive species
- Domesticated species
- Introduced species
- Neutralized species

64 of 100

246 PU_2016_159_M

Molecule that promote release of O_2 from hemoglobin is:-

- 2,3-mercapitoethanol
- Acetylcholine
- 3,2 - hemoglycerate
- 2,3 - bisphosphoglycerate

65 of 100

225 PU_2016_159_M

Formation of glucose from source other than CO_2 is known as:-

- Glycolysis
- Gluconeogenesis
- Hydrogenesis
- Hydrolysis

66 of 100

239 PU_2016_159_M

Mitotic cycle is initiated by the activation of:-

- Tubulin protein
- RNA polymerase
- MPF protein kinase
- Kinotochore protein

67 of 100

238 PU_2016_159_M

Acid rain occurs because of pollution of air by:-

- Chlorine
- Carbon Monoxide
- CO_2
- SO_2

68 of 100

236 PU_2016_159_M

Heteroblastic development is a characteristic feature of:-

- Submerged aquatic plants
- Free-floating aquatic plants
- Emergent aquatic plant
- All aquatic plants

69 of 100

247 PU_2016_159_M

Which of the following have more energy yield per unit mass?

- Proteins
- Fatty acids
- DNA
- Carbohydrate

70 of 100

228 PU_2016_159_M

Selectable marker that provides resistance to the antibiotic Kanamycin is:-

- Neomycin phosphotransferase
- Streptomycin phosphotransferase
- Hygromycinphosphotransferase
- Gentamycin acetyletransferase

71 of 100

227 PU_2016_159_M

Increased melting temperature for a double strand DNA results from high content of:-

- Cytosine+Guanine
- Adenine+ guanine
- Adenine+Cytosine
- Cytocine+Thymine

72 of 100

259 PU_2016_159_M

In protein secondary structure, the electrostatic interaction between two ionic group of opposite charges are referred as:-

- Hydrogen bonds
- Van der Waals bond
- disulfide bonds
- Salt bridges

73 of 100

249 PU_2016_159_M

Single strand DNA can self-bind to create type of secondary structures called:-

- α helix & β sheets
- Bubbles and knots
- Hairpin & loops
- minor grooves and double helix

74 of 100

255 PU_2016_159_M

Identify the second messenger molecule from the following:-

- cyclic adenosine monophophate;
- adenylecyclase;
- G protein;
- phospholipase

75 of 100

256 PU_2016_159_M

Adipose tissue stores:-

- Proteins
- Starch
- Triacyleglycerol
- Carbohydrates

76 of 100

237 PU_2016_159_M
The eye spot or stigma perform the function of:-

- Photosynthesis
- Visibility
- Photosensitization
- Respiration

77 of 100

248 PU_2016_159_M
The Antigen Presenting Cell among the following is:-

- Macrophage
- Monocytes
- T cell
- thymus epithelial cells

78 of 100

257 PU_2016_159_M
Typical denaturization temperature in a PCR is:-

- 95 °C
- 37 °C
- 25 °C
- 65 °C

79 of 100

258 PU_2016_159_M
Approximate end-to-end distance of $3X10^4$ base pair DNA is:-

- 3 µm
- 100 µm
- 30 µm
- 10 µm

80 of 100

235 PU_2016_159_M
Agar Agar is extracted mostly from:-

- Agaricusspp
- Phaeophyceaespp
- Argemonespp
- Rhodophyceaespp

81 of 100

268 PU_2016_159_D
In an axial flow impulse turbine, energy transfer takes place due to:-

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

82 of 100

297 PU_2016_159_D
During which of the following process heat rejection takes place in Carnot cycle?

- Isothermal expansion
- Isothermal compression
- Isentropic expansion
- Isentropic compression

83 of 100

277 PU_2016_159_D
Dissipation factor, tan δ, of a capacity measure by which bridge?

- Schering bridge
- Anderson bridge
- Hay Bridge
- Wien bridge

84 of 100

267 PU_2016_159_D
An isolated system is one in which:-

- both energy and mass cross the boundaries of the system
- neither mass nor energy crosses the boundaries of the system
- mass does not cross boundaries of the system, though energy may do so
- mass crosses the boundary but not the energy

85 of 100

295 PU_2016_159_D
A closed system is one in which:-

- mass does not cross boundaries of the system, though energy may do so
- mass crosses the boundary but not the energy
- neither mass nor energy cross the boundaries of the system
- both energy and mass cross the boundaries of the system

86 of 100

275 PU_2016_159_D
The overall heat transfer coefficient is the:-

- resistance due to wall material
- sum of conductances
- sum of resistances
- sum of convection coefficients

87 of 100

285 PU_2016_159_D
At thermal equilibrium:-

- absorptivity is lesser than emissivity
- sum of absorptivity and emissivity is unity
- absorptivity is equal to emissivity
- absorptivity is greater than emissivity

88 of 100

299 PU_2016_159_D
The measurement of a thermodynamic property known as temperature is based on:-

- none of these
- Zeroth law of thermodynamics
- Second law of thermodynamics
- First law of thermodynamics

89 of 100

278 PU_2016_159_D
If the enthalpy drop in the moving blades and fixed blades of a steam turbine is 10 kJ/kg and 15 kJ/kg respectively then what is the degree of reaction?

- 40%
- 33%
- 60%
- 67%

90 of 100

298 PU_2016_159_D
Otto cycle is also known as:-

- constant temperature cycle
- constant volume cycle
- constant temperature and pressure cycle
- constant pressure cycle

91 of 100

287 PU_2016_159_D

Intensive property of a system is one whose value:-

- remains constant
- depends on the mass of the system like volume
- does not depend on the mass of the system, like temperature, pressure, etc.
- is not dependent on the path followed but on the state

92 of 100

289 PU_2016_159_D

Which one of the following is NOT an accessory for the boiler?

- Condenser
- Economizer
- Air preheater
- Feed water pump

93 of 100

279 PU_2016_159_D

A penstock pipe of 10 cm diameter carries water under a pressure head of 100 m. If the wall thickness is 9 mm, what is the tensile stress in the pipe wall in MPa?

- 272.5
- 2725
- 545
- 1090

94 of 100

265 PU_2016_159_D

The ratio of maximum demand of the plant to the sum of individual maximum demand of various equipments is called:-

- demand factor
- diversity factor
- load factor
- maximum demand

95 of 100

266 PU_2016_159_D

Specific ratio for a blower is:-

- 1.20 to 1.32
- 1.11 to 1.20
- 0 to 1.11

- more than 1.32

96 of 100

276 PU_2016_159_D

Fin effectiveness will be increased more by:-

- higher thermal conductivity
- longer circumference
- having higher value of convection coefficient
- higher sectional area

97 of 100

286 PU_2016_159_D

Superheated vapour behaves as:-

- exactly as gas
- approximately as a gas
- as steam
- as ordinary vapour

98 of 100

269 PU_2016_159_D

If the distribution voltage is raised from 11 KV to 33 KV, the line power loss would be lowered by a factor:-

- 1/9
- 1/3
- 3
- 9

99 of 100

288 PU_2016_159_D

A power station's plant load factor is defined as the ratio of:-

- average load to peak load
- minimum load to peak load
- minimum load to average load
- the energy generated to that of maximum energy

100 of 100

296 PU_2016_159_D

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

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

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