393 PU M Tech Environmental Engineering and Management

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188 PU_2016_393_E
Time taken by sunlight to penetrate a window pan of 3mm thick is of the order of {speed of light (c) = 3 x 10^{8} m/sec}:-

- 10^{-11} sec
- 10^{-7} sec
- 10^{-13} sec
- 10^{-9}sec

2 of 100
101 PU_2016_393_E
Which is different in isotopes of an element?

- number of electrons
- atomic number
- mass number
- number of protons

3 of 100
166 PU_2016_393_E
The relationship between mean, median and mode for a moderately skewed distribution is:-

- mode = 3 median - 2 mean
- mode = median - 2 mean
- mode = 2 median - mean
- mode = 2 median - 3 mean

4 of 100
121 PU_2016_393_E
The agricultural field that produces maximum methane gas into atmosphere is:-

- wheat
- ground nut
- paddy
- cotton

5 of 100
159 PU_2016_393_E

$\int_{\pi/6}^{\pi/3} \frac{dx}{\sin 2x}$ is equal to:-

- log √3
- log (-1)
- log 3
- $\frac{1}{2}\log(-1)$

6 of 100

158 PU_2016_393_E

The minimum value of $x^2 + 250/x$ is:-

- 50
- 0
- 75
- 25

7 of 100

163 PU_2016_393_E

A row matrix has only:-

- one row with one or more columns
- one column with one or more rows
- one row and one column
- one element

8 of 100

218 PU_2016_393_E

A perfect black body is one whose:-

- absorptive power is infinity
- absorptive power is 1
- absorptive power is 0
- emissive power is 1

9 of 100

132 PU_2016_393_E

Substances used in bringing down the body temperature in high fever are called:-

- antibiotics
- antipyretics
- pyretics
- antiseptic

10 of 100

151 PU_2016_393_E

$\lim_{x \to 0} \frac{\log \cos x}{x}$ is equal to:-

- 1
- 0
- 2
- ∞

11 of 100

167 PU_2016_393_E

The geometric mean of 4, 5, 20, 25 is:-

- 1
- 100
- 10,000
- 10

12 of 100

173 PU_2016_393_E

The area enclosed by the curve $y^2 = 4x$ and the line $y = x$ is:-

- 1/2
- 8/3
- 4/3
- 2/3

13 of 100

175 PU_2016_393_E

If $-x^2 + 3x + 4 > 0$, then:-

- $-1 \leq x \leq 4$
- $-1 < x < 4$
- $x \leq -1$ or $x \geq 4$
- $x < -1$ and $x > 4$

14 of 100

201 PU_2016_393_E

If the car at rest , accelerates uniformly and attains a speed of 72 km/hr in 10 sec. then it covers a distance of:-

- 100m
- 50 m
- 200m

- 400m

15 of 100

118 PU_2016_393_E

When a litmus solution is shaken with a piece of charcoal:-

- no change
- it turns red to blue
- it turns blue to red
- it is decolourised

16 of 100

191 PU_2016_393_E

Which of the following pair of physical quantities has same dimensional formula ?

- Latent heat and specific heat
- Force and power
- Work and power
- Work and couple

17 of 100

186 PU_2016_393_E

For measuring radius accurately of a thin wire, we use:-

- Hygrometer
- Vernier caliper
- Screw gauge
- Spherometer

18 of 100

164 PU_2016_393_E

Let A be a square matrix. Then $A+A^T$ will be:-

- the identity matrix
- diagonal matrix
- skew-symmetric
- symmetric matrix

19 of 100

127 PU_2016_393_E

In order to increase the volume of a gas by 10%, the pressure of the gas should be:-

- decreased by 1%
- increased by 10%
- increased by 1%

- decreased by 10%

20 of 100

178 PU_2016_393_E

If $y=\sin(e^{x}-1)$, then y3 (0)=

- 4
- 0
- 1
- 2

21 of 100

102 PU_2016_393_E

Two solutions have different osmotic pressures. The solution of higher osmotic pressure is called:-

- hypotonic solution
- hypertonic solution
- isotonic solution
- none

22 of 100

109 PU_2016_393_E

A solution is called saturated if :-

- ionic product < solubility product
- ionic product = solubility product
- ionic product > solubility product
- none

23 of 100

129 PU_2016_393_E

Which is the most easily liquefiable rare gas?

- Argon
- Krypton
- Xenon
- Neon

24 of 100

202 PU_2016_393_E

A car moving with a speed of 50 km/hr can be stopped by brakes in 6 m. If the same car is moving with a speed of 100 km/hr , then minimum stopping distance is:-

- 6 m
- 24 m

- 12 m
- 18 m

25 of 100

219 PU_2016_393_E

A piece of steel floats in mercury. The specific gravities of mercury and steel are 13.6 and 7.8 respectively. For covering the whole piece, some water is poured over the mercury. What part of the steel piece will be inside the mercury ?

- 0.62
- 0.48
- 0.42
- 0.54

26 of 100

146 PU_2016_393_E

The value of $(i^5 + i^6 + i^7 + i^8 + i^9)/(1+i)=$

- ½
- $\frac{1}{2}(1+i)$
- 1
- $\frac{1}{2}(1-i)$

27 of 100

165 PU_2016_393_E

If the matrix product AB is zero, then:-

- A = 0 or B = 0
- It is not necessary that either of A or B should be zero
- A = 0 and B = 0
- All the statements are wrong

28 of 100

174 PU_2016_393_E

If the angle between a and b is π/6, then angle between 2a and 3b is:-

- π/4
- π/6
- π/2
- π/3

29 of 100

207 PU_2016_393_E

A very large no. of balls are thrown vertically upwards in quick succession in such a way that the next ball is thrown when the previous one is at the maximum height. If maximum height is 5m , then no. of balls thrown per min is (take g = 10 m/sec).

- 120
- 60
- 80
- 40

30 of 100

199 PU_2016_393_E

A body starts from rest and has an acceleration 20 cm/sec^2 .What is the distance covered by the body in first 8 sec?

- 160 cm
- 640 cm
- 1640 cm
- 1280 cm

31 of 100

108 PU_2016_393_E

Hydrochloric acid is stronger acid than acetic acid because:-

- it can neutralize large quantity of alkali
- it can corrode anything it comes in contact
- it ionizes completely into ions in aqueous solution
- none

32 of 100

145 PU_2016_393_E

If OP makes 4 revolutions in one second, the angular velocity in radians per second is:-

- 8π
- 4π
- 2π
- π

33 of 100

117 PU_2016_393_E

Pure methane can be produced by:-

- reduction with H_2
- Soda lime decarboxylation
- Kolbe's electrolytic method
- Wurtz reduction

34 of 100

208 PU_2016_393_E

A body freely falling from rest has a velocity v after it falls through a height h . The distance it has to fall down further for its velocity to become double, is:-

- 4h
- 8h
- 6h
- 10h

35 of 100

149 PU_2016_393_E

The line segment joining the points (-3, -4) and (1, -2) is divided by y-axis in the ratio:-

- 3:1
- 3:2
- 1:3
- 2:3

36 of 100

162 PU_2016_393_E

A matrix is:-

- A collection of real or complex numbers
- An array of real numbers
- A collection of real numbers
- An array of real or complex numbers

37 of 100

128 PU_2016_393_E

Waxes are esters of:-

- glycerol
- glycerol + fatty acids
- long chain alcohol
- long chain alcohol and long chain fatty acids

38 of 100

189 PU_2016_393_E

Which of the following are dimensions of coefficient of friction ?

- M^2LT^{-2}
- $M^0L^0T^0$
- MLT^{-2}

- M^2LT

39 of 100

131 PU_2016_393_E

Liquor NH_3 bottles are opened only after cooling. This is because:-

- it is mild explosive
- it is corrosive liquid
- it is lactymatory
- it generates high vapour pressure

40 of 100

144 PU_2016_393_E

$\lim_{x \to 0} \{(\sin x - x)/x^3\}$ equals:-

- $-\frac{1}{3}$
- $\frac{1}{3}$
- $\frac{1}{0}$
- $-\frac{1}{6}$

41 of 100

161 PU_2016_393_E

The indefinite integral of x.dx is:-

- x
- x^2
- $\frac{x^2}{2} + c$
- $\frac{x^2}{2}$

42 of 100

177 PU_2016_393_E

The triangle joining the points (2,7), (4,-1),(-2,6) is:-

- Equilateral

- Isosceles
- Right angled
- Square

43 of 100

122 PU_2016_393_E

The presence of which of the following in drinking water is responsible for mottling of teeth?

- iodine
- chlorine
- fluorine
- mercury

44 of 100

203 PU_2016_393_E

A car, starting from rest, accelerates at the rate *f* through a distance S, then continues at constant speed for time t and then decelerates at the rate *f*/2 to come to rest. If the total distance traversed is 15 S, then:-

- S = 24 *f* t
- S = *f*t
- S = $ft^2/36$
- S = $f\,t^2/72$

45 of 100

187 PU_2016_393_E

A wire has a mass (0.3 ± 0.003)g, radius (0.5 ± 0.005)mm and length (6 ± 0.06)cm. The maximum percentage error in the measurement of its density is:-

- 3
- 2
- 4
- 1

46 of 100

152 PU_2016_393_E

If $x = t + \frac{1}{t}, y = t - \frac{1}{t}$ then d^2y/dx^2:-

- $(t^2+1/(t^2-1)$
- $-4t/(t^2-1)$
- $-4t^3/(t^2-1)^3$
- $-4t^2/(t^2-1)^2$

47 of 100

111 PU_2016_393_E

According to periodic law, the chemical properties of elements are the periodic function of their:-

- mass number
- atomic mass
- atomic number
- density

48 of 100

212 PU_2016_393_E

A motorcycle is moving with a velocity 80 km/hr ahead of a car moving with a velocity of 65 km/hr in the same direction. What is the relative velocity of the motorcycle with respect to the car?

- 15 km/hr
- 25 km/hr
- 145 km/hr
- 20 km/hr

49 of 100

211 PU_2016_393_E

Velocity - time curve for a body , projected vertically upwards, is:-

- Hyperbola
- Ellipse
- Parabola
- Straight line

50 of 100

147 PU_2016_393_E

If $2i^{2} + 6i^{3} + 3i^{16} - 6i^{19} + 4i^{25} = x + iy$, then:-

- x = 4, y = -1
- x = -1, y = -4
- x = 1, y = 4
- x = 1, y = -4

51 of 100

198 PU_2016_393_E

A car covers the first half of the distance between two places with a speed of 40 km/hr and other half at 60km/hr. The average speed of the car is:-

- 48 km/hr
- 60 km/hr
- 50 km/hr

- 40km/hr

52 of 100

112 PU_2016_393_E

The extraction of metals from sulphide ores is generally done by:-

- electrolysis
- metal displacement
- smelting
- froath floatation process

53 of 100

119 PU_2016_393_E

Haemoglobin is a complex of:-

- Fe^{3+}
- Fe^{4+}
- CN
- Fe^{2+}

54 of 100

184 PU_2016_393_E

Faraday is the unit of:-

- Current
- Resistance
- Charge
- Voltage

55 of 100

209 PU_2016_393_E

The initial velocity of a body moving along a straight line is 7m/sec . It has a uniform acceleration of 4 m/sec^2. The distance covered by the body in the 5^{th} second of its motion is:-

- 25 m
- 35 m
- 50 m
- 85 m

56 of 100

206 PU_2016_393_E

A body projected vertically upwards with a velocity u returns to the starting point in 4 sec . If g = 10 m/sec^2 , the value of u is:-

- 5 m/sec
- 15 m/sec

- 10 m/sec
- 20 m/sec

57 of 100

176 PU_2016_393_E

$i^{57} + 1/i^{125}$, when simplified has the value:-

- 2i
- -2i
- 0
- 2

58 of 100

107 PU_2016_393_E

Which of the following is always true for an exothermic process?

- $\Delta S = 0$
- $\Delta H < 0$
- $\Delta G = 0$
- $\Delta H > 0$

59 of 100

185 PU_2016_393_E

The S.I unit of radioactivity is:-

- Rutherford
- Curie
- Roentgen
- Becqueral

60 of 100

148 PU_2016_393_E

If $x = ½ (\sqrt{3} + i)$, then x^3 is:-

- -i
- 1
- -1
- i

61 of 100

238 PU_2016_393_M

The electric field required to keep a water drop of mass m just to remain suspended, when charged with one electron, is:-

(e=charge of one electron)

- mg
- (mg)/e
- (e m)/g
- e mg

62 of 100

243 PU_2016_393_M

Water is flowing over a fixed horizontal surface. If the velocity gradient at a distance 10 cm above the surface is 2 sec^{-1}, then velocity of layer will be:-

- 0.4 m/sec
- 0.2m/sec
- 0.1 m/sec
- 0.3m/sec

63 of 100

222 PU_2016_393_M

The pH of blood does not appreciably change by a small addition of acid or a base because blood:-

- can be easily coagulated
- contains serum protein which acts as buffer
- contains iron as a part of the molecule
- is body fluid

64 of 100

236 PU_2016_393_M

When a body is connected to the earth, then electrons from the earth, flow into the body. It means that the body is:-

- An insulator
- Positively charged
- Uncharged
- Negatively charged

65 of 100

255 PU_2016_393_M

The maximum possible area that can be enclosed by a wire of length 20 cm by bending it into the form of a sector in square cm is:-.

- 30
- 10
- 25
- 50

66 of 100

241 PU_2016_393_M

A 20 cm long capillary tube is dipped in water. The water rises upto 8 cm. If entire arrangement is put in a freely falling elevator, the length of water column in the capillary tube will be:-

- 10 cm
- 8 cm
- 20 cm
- 4 cm

67 of 100

244 PU_2016_393_M

In plant, sucrose solution of coefficient of viscosity 0.0015 N-S-m^{-2} is driven at a velocity of 10^{-3}m/sec through xylem vessels of radius 2 micrometer and length 5 micrometer. The pressure difference across the length of xylem vessels is

- 10 N/m^2
- 15 N/m^2
- 5 N/m^2
- 20 N/m^2

68 of 100

248 PU_2016_393_M

$$\int_0^1 \frac{\log(1+x)}{x}\,dx=$$

- $\frac{\pi^2}{2}$
- $\frac{\pi^2}{6}$
- Π
- $\frac{\pi^2}{12}$

69 of 100

223 PU_2016_393_M

Methane reacts with excess of chlorine in presence of diffused sunlight to give:-

- methyl chloride
- carbon tetrachloride
- methylene chloride
- chloroform

70 of 100

226 PU_2016_393_M

Which alkali metal can be preferably used in photoelectric cell:-

- Lithium
- Cesium
- Rubidium
- Sodium

71 of 100

235 PU_2016_393_M

A spherical drop of water has 1 mm radius. If the surface tension of water Is 70×10^{-3} N/m, then difference of pressures between inside and outside of spherical drop is:

- 35 N/m^2
- 140 N/m^2
- 70 N/m^2
- Zero

72 of 100

234 PU_2016_393_M

When there are no external forces, the shape of a small liquid drop is determined by:-

- Density of the liquid
- Temperature of air
- Surface tension of the liquid
- Viscosity of air

73 of 100

251 PU_2016_393_M

The work done by the force F = 2i - 3j + 2k in moving a particle from (3, 4, 5) to (1, 2, 3) is:-

- -4
- 0
- -2
- 3/2

74 of 100

256 PU_2016_393_M

If sin (x-y)=cos (x+y)=, $\frac{1}{2}$ the value of x and y lying between 0° and 180° are given by:-

- x = 165°, y = 45°
- x = 45°, y = 15°
- x = 165°, y = 15°

- x = 45°, y = 135°

75 of 100

245 PU_2016_393_M

24 cm^3 of water flows per second through a capillary tube of radius r cm and length l cm, when connected to a pressure head h cm of water. If a tube of the length l/2 cm and radius r/2 cm is connected to the same pressure head, then volume of water flowing per second through the tube is:-

- $24cm^3/sec$
- $3cm^3/sec$
- $12cm^3/sec$
- $6cm^3/sec$

76 of 100

228 PU_2016_393_M

Decomposition of benzene diozonium chloride by using Cu_2Cl_2 / HCl to form chlorobenzene is:-

- Raschig's reaction
- Sand Meyers reaction
- Cannizarros
- Kolbe's reaction

77 of 100

254 PU_2016_393_M

An ordinary cube has 4 blank faces, one face marked 2 and another marked 3. Then the probability of obtaining 12 in 5 throws is:-

- 5/3646
- 5/1944
- 5/1296
- 5/2592

78 of 100

231 PU_2016_393_M

Thermodynamics standard conditions of temperature and pressure are:-

- 0° C and 101.3 K pa
- 0° C and 1 atm
- 273K and 101.3 K pa
- 298 K and 1atm

79 of 100

232 PU_2016_393_M

The gaseous envelope around the earth is known as atmosphere. The lowest layer of this is extended up to 10km, from sea level, this layer is:-

- stratosphere

- hydrosphere
- mesosphere
- troposphere

80 of 100

224 PU_2016_393_M

CCl_4 can be used as a fire extinguisher because:-

- it gives incombustible vapour
- of its low boiling point
- of its covalent bond
- of its high melting point

81 of 100

293 PU_2016_393_D

If f(x)is a polynomial satisfying $f(x).f\left(\frac{1}{x}\right) = f(x) + f\left(\frac{1}{x}\right) \text{and } f(3) = 28,$ then f(4)=

- 63
- 65
- 7
- 17

82 of 100

271 PU_2016_393_D

The ionization of hydrogen atom gives:-

- proton
- hydroxyl ion
- hydronium ion
- hydride ion

83 of 100

282 PU_2016_393_D

At some temperature T, a bronze pin is little to large to fit into a hole drilled in a steel block .The change in temperature required for exact fit is minimum , when:-

- Both block and pin are cooled
- Both block and pin are heated
- Bronze pin is heated
- Steel block heated

84 of 100

276 PU_2016_393_D

Water enters in a horizontal pipe of radius 2 cm with a velocity of 1 m/sec. If the water comes from the nozzle with a velocity of 4 m/sec, then radius of the nozzle is:-

- 2cm
- 4 cm
- 0.5 cm
- 1cm

85 of 100

261 PU_2016_393_D

A primary amine can be distinguished from secondary and tertiary amines by:-

- reaction with methyl iodide
- P^H test
- reaction with acetyl chloride
- carbylamine reaction

86 of 100

260 PU_2016_393_D

For blasting purposes TNT is mixed with:-

- NH_4NO_2
- $(NH_4)_2SO_4$
- NH_4Cl
- NH_4NO_3

87 of 100

292 PU_2016_393_D

In a triangle ABC, if a=4,b=3,$\angle A=60°$, then c is the root of the equation:-

- $c^2-3c-7 = 0$
- $c^2-3c+7 = 0$
- $c^2+3c-7 = 0$
- $c^2+3c+7 = 0$

88 of 100

262 PU_2016_393_D

The IUPAC name of tertiary butyl iodide is:-

- 2- iodo, 2-methyl propane
- 4 - iodobutane
- 1- iodo, 3-metyhl propane

- 2 - iodobutane

89 of 100
297 PU_2016_393_D

If $p = q$, then $\int_0^{\pi} \sin px \cos qx \, dx =$

- π/2
- π
- 0
- π/4

90 of 100
267 PU_2016_393_D
Heat produced in calories by the combustion of 1g of Carbon is called:-

- heat of combustion of Carbon
- calorie value of Carbon
- heat of formation of Carbon
- heat of product of Carbon

91 of 100
272 PU_2016_393_D
Acetaldehyde is the rearrangement product of:-

- methyl alcohol
- allyl alcohol
- ethyl alcohol
- vinyl alcohol

92 of 100
296 PU_2016_393_D
The derivative of $\sin^{-1} x$ w.r.t $\cos^{-1} \sqrt{(1-x^2)}$ is:-

- $\cos^{-1} x$
- $\sin^{-1} x$
- $1/\sqrt{[(1-x^2]}$
- 1

93 of 100
266 PU_2016_393_D
In which of the following cases entropy decreases?

- polymerization

- liquid changing to gas
- expansion of a gas
- crystals dissolve

94 of 100

283 PU_2016_393_D

At 100°C, the substance that causes the most severe burn, is:-

- Hot air
- Steam
- Water
- Oil

95 of 100

281 PU_2016_393_D

Which of the following material has the largest specific heat?

- Mercury
- Water
- Iron
- Diamond

96 of 100

287 PU_2016_393_D

The area of the triangle with vertices at the points (a,b+c), (b,c+a), (c,a+b) is:-

- 0
- 1
- a+b+c
- ab+bc+ca

97 of 100

277 PU_2016_393_D

If blood flows in an artery of radius 2 mm with maximum average velocity , in laminar flow , then the rate of flow of blood in artery is (Density of blood = 1.06×10^3 kg/m3 and viscosity of blood = 0.021 poise) :-

- 1.25×10^{-5} m^3/sec.
- 5×10^{-5} m^3/sec.
- 2.5×10^{-5} m^3/sec.
- 8.5×10^{-5} m^3/sec.

98 of 100

286 PU_2016_393_D

A gas perform no work, when it expands:-

- Isobarically
- Adiabatically
- Isothermally
- Isochorically

99 of 100

273 PU_2016_393_D

After terminal velocity is reached, acceleration of a spherical body in a viscous fluid is:-

- Equal to g
- Zero
- More than g
- Less than g

100 of 100

291 PU_2016_393_D

Equation of the curve passing through (3, 9) which satisfies the differential equation $dy/dx=x+(1/x^2)$ is:-

- $6xy = 3x^3+29x-6$
- $6xy = 3x^2-6x+29$
- $6xy = 3x^3+29x+6$
- $6xy = 3x^3-29x+6$

PU M Tech Environmental Engineering and Mgmt

1 of 100
152 PU_2015_393
Size of colloidal particles varies:-

- 10^{-9} - 10^{-12} m
- 10^{-3} - 10^{-9} m
- 10^{-6} - 10^{-9} m
- 10^{-12} - 10^{-19} m

2 of 100
108 PU_2015_393
With a rise in temperature, the surface tension of a liquid:-

- Changes erratically
- Decreases
- Does not change
- Increases

3 of 100
172 PU_2015_393
Conversion of $KMnO^4$ to $MnSO^4$ is a process of:-

- Reduction
- Dehydration
- Oxidation
- Both oxidation and reduction

4 of 100
205 PU_2015_393

In a triangle ABC, if $a = 4, b = 3, \angle A = 60°$, then c is the root of the equation

- $c^2 – 3c + 7 = 0$
- $c^2 + 3c + 7 = 0$
- $c^2 – 3c – 7 = 0$
- $c^2 + 3c – 7 = 0$

5 of 100
141 PU_2015_393
Molarity of a solution relates the?

- Moles of the solute and solvent

- Volume of solute and the volume of solvent
- Moles of solute and mass of solvent
- Volume of solution and moles of solute

6 of 100

121 PU_2015_393

A plate of area 10 cm^2 is separated from another plate by a 1 mm thick layer of glycerine. If the coefficient of viscosity is 20 poise then the force required to move the upper plate with a velocity of 1 cm/sec. over the lower one is:-

- 80 dyne
- 2000 dyne
- 200 dyne
- 800 dyne

7 of 100

126 PU_2015_393

When light travels from an optically rarer medium to an optically denser medium, the velocity decreases because of change in:-

- Amplitude
- Phase
- Wavelength
- Frequency

8 of 100

130 PU_2015_393

Woollen clothes keep the body warm, because:-

- wood rejects heat from the outer objects
- wool absorbs radiant heat from outer objects
- wool increases the temperature of the body
- wool is a bad conductor of heat, so it will not allow heat to flow out from the body

9 of 100

101 PU_2015_393

The number of grams in one pound is:-

- 546
- 226
- 526
- 453.6

10 of 100

142 PU_2015_393

Which of the following bond is most reactive?

- C ≡ C
- C – C
- C = C
- All

11 of 100

166 PU_2015_393

Which of the following relates to light the wave as well as particle nature?

- Diffraction
- E = hv
- $E = mc^2$
- Interference

12 of 100

137 PU_2015_393

A monochromatic visible light consist of:-

- A single ray of light
- Light of a single wavelength
- Light of a single wavelength with all the colours of the spectrum of white light
- Light consisting of many wavelengths with a single colour

13 of 100

146 PU_2015_393

Which of the following is an emulsifier?

- NaCl
- Soap
- Oil
- Water

14 of 100

155 PU_2015_393

In the solution of a gas in liquid the solubility?

- Increases with temperature
- Is unaffected by temperature
- Increases with decrease in pressure
- Increases with pressure

15 of 100

115 PU_2015_393

Paraffin wax contracts on solidification. The melting point of wax will:-

- Not change with pressure
- Decrease linearly with pressure
- Decrease with pressure
- Increase with pressure

16 of 100

169 PU_2015_393

In the coagulation of positively charged colloidal solution which of the following has maximum coagulating power?

- $C1^{-}$
- $[Fe(CN)_6]^{4-}$
- PO^{3-}_4
- SO^{2-}_4

17 of 100

127 PU_2015_393

One of the devices to produce plane polarised light is:-

- a biprism
- a nicol prism
- a half-wave plate
- a crystal

18 of 100

160 PU_2015_393

In decomposition reactions, enthalpy of products is always _____ than the enthalpy of reactants?

- Lesser
- Constant
- Infinite
- Greater

19 of 100

140 PU_2015_393

A sensitive magnetic instrument can be shielded very effectively from outside fields by placing it inside a box of:-

- soft iron of high permeability
- teak wood
- plastic material
- a metal of high conductivity

20 of 100

195 PU_2015_393

Which of the following pairs of solutions can we expect to be isotonic at the same temperature?

- 0.1 M NaCl and 0.1 M Na_2SO_4
- 0.1M $Ca(NO_3)_2$ and 0.1 M Na_2SO_4
- 0.1 M urea and 0.2 M $MgCl_2$
- 0.1 M urea and 0.1 M NaCl

21 of 100

143 PU_2015_393

Naturally occurring polymer is?

- PVC
- Polyethylene
- Proteins
- CH_3COOH

22 of 100

117 PU_2015_393

Soap action is due to:-

- Colloidal dispersion of micelles in water
- Oil drop dispersal
- Micelle formation
- All of these

23 of 100

189 PU_2015_393

How many grams of CH_3OH would have to be added to water to prepare 150 mL of solution that is 2.0 M CH_3OH?

- 9.6
- 4.3×10^2
- 2.4
- 9.6×10^3

24 of 100

133 PU_2015_393

In an ordinary heater if the length of the coil is halved, then a given quantity of water will boil in:-

- same time
- cannot be compared because specific resistance of material of wire is not given
- less time
- more time

25 of 100
107 PU_2015_393
The principle of the operation of a hydraulic press is based on:-

- Newton's law of gravitation
- Dalton's law of partial pressure
- Boyle's law
- Pascal's law

26 of 100
136 PU_2015_393
A electric field can deflect:-

- Gamma rays
- X-rays
- α particles
- Neutrons

27 of 100
203 PU_2015_393
If (x, 3) and (3, 5) are the extremities of a diameter of a circle with centre at (2, y), then the value of x and y are:-

- x=4, y=8
- x=1, y=4
- x=4, y=1
- x=8, y=2

28 of 100
211 PU_2015_393

$$\int x^2 e^{2x}\, dx =$$

- $\frac{1}{2}e^{2x}\,[2x^2 - 2x + 1] + c$
- $e^{2x}\,[2x^2 - 2x + 1] + c$
- $\frac{1}{4}e^{2x}\,[2x^2 + 2x - 1] + c$
- $2x+c$

29 of 100
162 PU_2015_393
The solvent which is neither proton donor nor proton acceptor is called?

- Aprotic
- Amphoteric
- Protonic
- Neutral

30 of 100

122 PU_2015_393

A closed bottle containing water at 30°C is carried to the moon in a space ship. If it is placed on the surface of the moon, what will happen to the water as soon as the lid is opened?

- Nothing will happen to it
- The water will freeze
- It will decompose into H_2 and O
- The water will boil

31 of 100

132 PU_2015_393

If electric field is uniform, then the electric lines of forces are:-

- circular
- convergent
- parallel
- divergent

32 of 100

184 PU_2015_393

Electrophiles are:-

- Nucleus hating reagents
- Nucleus loving reagents
- Electron loving species
- Electron hating species

33 of 100

147 PU_2015_393

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

- Promoter
- Catalyst poison
- Catalyst
- Inhibitor

34 of 100

102 PU_2015_393

The weight of a body at the centre of the earth is:-

- Same as on the surface of earth
- Infinite
- Indeterminate
- Zero

35 of 100

171 PU_2015_393

The metal in a complex acts as:-

- Lewis base
- Catalyst
- Neutral compound
- Lewis acid

36 of 100

159 PU_2015_393

Negative catalyst is that?

- Promotes the side reaction
- Retards the side reaction
- Which retards the rate of reaction
- Takes the reaction in backward direction

37 of 100

150 PU_2015_393

The adsorption theory explains the action of all except:-

- Catalytic poisons
- Heterogeneous catalysis
- Acid-base catalysis
- Catalytic promoters

38 of 100

199 PU_2015_393

The rate for the reaction RCl + NaOH(aq.) → ROH + NaCl is given by, Rate = k_1 [RC]. The rate of the reaction will be?

- Unaffected by increasing the temperature of the reaction
- Decreased on increasing the temperature of the reaction
- Doubled on doubling the concentration of NaOH
- Halved on reducing the concentration of RCl to one half

39 of 100

207 PU_2015_393
Equation of normal to the curve y = x (2 – x) at the point (2, 0) is:-

- $x - 2y + 2 = 0$
- $2x + y = 4$
- $x = y = 2$
- $x - 2y = 2$

40 of 100

104 PU_2015_393
Hair of shaving brush cling together when it is removed from water, due to:-

- Elasticity
- Surface tension
- Viscosity
- Friction

41 of 100

105 PU_2015_393
A temperature degree on the Kelvin scale in same as:-

- Temperature on the Richter scale
- A temperature degree on the Fahrenheit scale
- Temperature degree on Reaumer scale
- Temperature degree on the Celsius scale

42 of 100

213 PU_2015_393
A matrix is:-

- A collection of real or complex numbers
- An array of real numbers
- An array of real or complex numbers
- A collection of real numbers

43 of 100

149 PU_2015_393
As a general rule, adding a catalyst to a reacting system:-

- Increases and decreases to yield irregularly
- Does not affect the yield of product
- Decreases the yield of the product
- Increase the yield of the product

44 of 100

131 PU_2015_393
Which of the following is the unit of electric charge?

- ampere
- volt
- coulomb
- newton

45 of 100

148 PU_2015_393
In the case of osmosis, solvent molecules move from?

- Higher concentration to lower concentration
- One region to another
- Higher vapour pressure to lower vapour pressure
- Lower vapour pressure to higher vapour pressure

46 of 100

156 PU_2015_393
If a substance dissolves at saturation with the evolution of heat, the solubility?

- Decreases with increasing temperature
- Does not change with temperature
- Increases with increasing temperature
- Becomes exactly half

47 of 100

113 PU_2015_393
Maximum possibility of turbulent flow is in a fluid of:-

- Low density and low viscosity
- High density and low viscosity
- Low density and high viscosity
- High density and high viscosity

48 of 100

129 PU_2015_393
Pin hole camera is based upon:-

- Rectilinear propagation of light
- Corpuscular theory of light
- Refraction of light
- Wave theory of light

49 of 100

180 PU_2015_393
A mixture of acetone and methanol can be separated by?

- Flash distillation
- Vacuum distillation
- Steam distillation
- Fractional distillation

50 of 100

139 PU_2015_393
Susceptibility is positive and small for a:-

- paramagnetic substance
- diamagnetic substance
- non-magnetic substance
- ferromagnetic substance

51 of 100

135 PU_2015_393
The infrared spectrum lies between:-

- radio wave and micro-wave region
- the visible and ultraviolet region
- the micro-wave and visible region
- the ultraviolet and the X-ray region

52 of 100

134 PU_2015_393
According to classical theory the proposed circular path of an electron in Rutherford atom model will be:-

- circular
- spiral
- parabolic
- straight line

53 of 100

124 PU_2015_393
Sunlight filtering through a tree often makes circular patches on the ground because:-

- The space through which light penetrates is round
- The sun is round
- Due to diffraction phenomenon
- Light is transmitted as wave motion

54 of 100

144 PU_2015_393
In which of the following Bakelite, the phenol and formaldehyde plastic is not used?

- Combs and fountain pen
- Gramophone records
- Electrical fuses
- Paints

55 of 100

153 PU_2015_393
Chemical equilibrium is dynamic in nature because:-

- The concentration of reactants and products become same at equilibrium
- The equilibrium is maintained rapidly
- The concentration of reactants and products are constant but different
- Both forward and backward reactions occur at all times with same speed

56 of 100

119 PU_2015_393
Which one of the waves cannot be polarised?

- Sound waves
- Ultraviolet rays
- Radio waves
- X-rays

57 of 100

128 PU_2015_393
Water evaporates under the atmospheric pressure. If now the same water is placed under vacuum, then the rate of evaporation:-

- Will double
- Will remain unchanged
- Will increase
- Will decrease

58 of 100

138 PU_2015_393
A sample of an ideal gas occupies a volume ‘V’ at a pressure ‘P’ and absolute temperature ‘T’ the mass of each molecule is ‘m’. the expression for the density of gas is” (R: gas constant).

- Pm / RT
- m RT
- P / RT
- P / RTC

59 of 100
157 PU_2015_393
Which of the following is not an intensive property?

- Mass
- Temperature
- Density
- Molarity

60 of 100
110 PU_2015_393
When a sealed glass vessel filled with water at 4°C is cooled, it breaks because:-

- of anomalous expansion
- of contraction of the glass
- both
- of expansion of the glass

61 of 100
225 PU_2015_393
A solution of pH 9.0 is one thousand times as basic as a solution of pH?

- 4
- 6
- 10
- 7

62 of 100
237 PU_2015_393
Two equal drops of water are falling through the air with a terminal velocity of 10 cm/sec. If the drops coalesce, then the terminal velocity is:-

- 5 cm/sec
- 20 cm/sec
- $10(2)^{2/3}$ cm/sec
- 10 cm/sec

63 of 100
235 PU_2015_393
10 gm of ice at -20°C is dropped into a calorimeter containing 10 gm of water at 10°C. The specific heat of water is twice that of ice. When equilibrium is reached, the calorimeter will contain:-

- 20 gm ice
- 20 gm water
- 5 gm ice and 15 gm water

- 10 gm ice and 10 gm water

64 of 100

254 PU_2015_393

If in a ΔABC, $\sin A = \sin^2 B$ and $2\cos^2 A = 3\cos^2 B$, then the ΔABC is

- right angled
- obtuse angled
- equilateral
- isosceles

65 of 100

223 PU_2015_393

Area bounded by the curve $y=x^3$, the x-axis and the ordinates x=-2 and x=1 is:-

- -9
- 17/4
- -15/4
- 15/4

66 of 100

221 PU_2015_393

If $a + b + c = 0$, the straight line $2ax + 3by + 4c = 0$ passes through the fixed point:-

- (2, 2)
- (4/3, 4/3)
- (2, 4/3)
- no such fixed point

67 of 100

231 PU_2015_393

The total area of cross-section is 0.25 m^2. If blood is flowing at the rate of 100 cm^3/sec then the average velocity of flow of blood through the capillaries is:-

- 0.4 mm/s
- 4 mm/s
- 25 mm/s
- 400 mm/s

68 of 100

241 PU_2015_393

The acceleration of a particle at time t is given by $A = -a\omega^2 \sin \omega t$
Its displacement at time t is:

- $-a\omega^2 \sin \omega t$
- $a \sin \omega t$
- $(a\omega^2 \sin \omega t/2)$
- $a \cos \omega t$

69 of 100

256 PU_2015_393
Water rises to a height of 10 cm when a glass tube is dipped vertically in it, what will be the rise if the tube is inclined at 30° to the vertical:-

- $\frac{\sqrt{3}}{10}$ cm
- 10 cm
- $\frac{5\sqrt{3}}{2}$
- $\frac{20}{\sqrt{3}}$

70 of 100

252 PU_2015_393
If $A + B + C = \pi$, then the value of tan A + tan B + tan C is given by:-

- 1
- cot A cot B cot C
- –1
- tan A tan B tan C

71 of 100

239 PU_2015_393
A dish of light material, partially filled with water, floating in a pan of water. A small stone, tied to string, is carefully lowered into the water in the dish such that it does not touch the sides or the bottom of the dish. Check the correct statement.

- The level of the dish sinks a little lower
- The level of the dish rises a little higher
- The dish sinks to the bottom of the pan
- The dish maintains its level in the pan

72 of 100

227 PU_2015_393
The pH of a solution is 4. The $[H^+]$ ion concentration of the solution is?

- 0.4 moles/litre

- 4×10^4
- 10^{-4}
- 4 moles/litre

73 of 100

233 PU_2015_393

Two thermometers, one Celsius and the other Fahrenheit are put in a hot bath. The reading on Fahrenheit thermometer is just three times the reading on Celsius thermometer. The temperature of the bath is:-

- 70°C
- 80°C
- 100°C
- 80/3°C

74 of 100

248 PU_2015_393

A toy of mass M_1 is pulled along a horizontal frictionless surface by a rope of mass M_2. A force F is applied to the free end of the rope. The force exerted on the cart is:-

- $\frac{FM_1}{M_1+M_2}$
- F
- $\frac{FM_1}{M_1-M_2}$
- $\frac{FM_2}{M_1+M_2}$

75 of 100

246 PU_2015_393

When a 1 Newton force acts on a 1 kg body that is able to move freely, the body receives:-

- An acceleration of 1 m/sec^2
- A speed of 1 m/sec
- An acceleration of 1 cm/sec^2
- An acceleration of 980 cm/sec^2

76 of 100

229 PU_2015_393

The weight of 11.2 litres of CO_2 at S.T.P. would be?

- 32 gm
- 88 gm
- 44 gm

- 22 gm

77 of 100
258 PU_2015_393

$\lim_{x \to 0} \frac{1-\cos x}{x^2}$ is equal to

- ½
- 1
- 0
- ¼

78 of 100
250 PU_2015_393
Two satellites of masses m_1 and m_2 ($m_1 > m_2$) are revolving round the earth in circular orbits of radii r_1 and r_2 ($r_1 > r_2$) respectively. Which of the following statements is true regarding their speed v_1 and v_2?

- $v_1/r_1 = v_2/r_2$
- $v_1 < v_2$
- $v_1 > v_2$
- $v_1 = v_2$

79 of 100
245 PU_2015_393
The rate law for a reaction A + B → Product is rate = K $[A]^1$ $[B]^2$. Then, which one of the following statements is false?

- If [B] is held constant while [A] is doubled, the reaction will proceed twice as fast
- This is a third order reaction
- If [A] is held constant while [b] is reduced to one quarter, the rate will be halved
- If [A] and [B] are both doubled, the reaction will proceed 8 times as fast

80 of 100
243 PU_2015_393
In the following reaction, $4P + 3KOH + 3H_2O \rightarrow 3KH_2PO_2 + PH_3$

- Only P is reduced
- P is neither oxidised nor reduced
- Only P is oxidised
- P is oxidised as well as reduced

81 of 100
265 PU_2015_393

The complex number sin x + i cos 2x and cos x-i sin 2x are conjugate to each other for:-

- No value of x
- $x = (n + 1/2)\pi$
- $x = 0$
- $x = n\pi$

82 of 100
298 PU_2015_393

What is the percentage of ionization of 0.1 M Ch_3COOH, at 298 K ($K_\alpha = 1.8 \times 10^{-5}$)?

- 1.34
- 0.64
- 1.0
- 3.44

83 of 100
297 PU_2015_393

If x=log t+sin t, y=e^t+cos t, then $\frac{dy}{dx}$ =

- $\frac{t(e^t - \sin t)}{1 + t\cos t}$
- $\frac{1 + t\cos t}{t(e^t - \sin t)}$
- Sin t
- $\frac{t(1 + t\cos t)}{e^e \sin t}$

84 of 100
273 PU_2015_393

If $y = \sin(m \sin^{-1} x)$, then

- $(1 - x^2) y_2 - x y_1 - m^2 y = 0$
- $(1 - x^2) y_2 - x y_1 + m^2 y = 0$

- $(1-x^2)y_2 + xy_1 - m^2y = 0$
- $(1-x^2)y_2 - xy_1 - m^2y = 1$

85 of 100

263 PU_2015_393

A cube of size 10 cm is floating in equilibrium in a tank of water. When a mass of 10 gm is placed on the cube. The depth of cube inside water increases by:(g = 10 ms^{-2}, density of water = 10^3 kg m^{-3})

- 1 mm
- 0.1 m
- 0.1 mm
- 1 cm

86 of 100

279 PU_2015_393

The positive values of a which satisfies

$$\int_0^a (3x^2 + 4x - 5)dx = a^3 - 2, \text{ are}$$

- 2, –1/2
- 2, 1/2
- 1,2
- 1, –2

87 of 100

289 PU_2015_393

Let the vectors 2**i** + 3**j** - 4**k** and *a***i** + *b***j** + *c***k** be perpendicular. Then:-

- *a* = 4, *b* = 5, *c* = -4
- *a* = 4, *b* = 4, *c* = 5
- *a* = 2, *b* = 3, *c* = -4
- *a* = 4, *b* = 4, *c* = -5

88 of 100

275 PU_2015_393

The area bounded by the normal at (1, 2) to the parabola $y^2=4x$, x-axis and the curve is given by:-

- 7/3
- 4/3
- 1/3

- 10/3

89 of 100

295 PU_2015_393

Solution of the diff. eq^n. $\frac{dy}{dx}+\frac{3x+2y-5}{2x+3y-5}=0$ is

- (x+y)+3z = c
- $x^2+4xy-y^2-4x+6y = c$
- $(x+2y)^2+3y = c$
- $3x^2+4xy+3y^2-10x-10y = c$

90 of 100

287 PU_2015_393

The area of the triangle whose two sides are given by 4i – j + k and 4j + 2k is:-

- √ (14)
- 4√ (14)
- 2√ (14)
- 16√ (14)

91 of 100

291 PU_2015_393

The sum of 20 terms of the series 1 + 4 + 5 + 6 + 7 + ... is

- 248
- 247
- 249
- 250

92 of 100

281 PU_2015_393

Vectors 2**a**–**b**+**c**, 4**a**–7**b**–**c** and 3**a**+6**b**+6**c**; **a**, **b**, **c** are non-zero; non-coplanar; are:-

- both collinear and coplanar
- neither collinear nor coplanar
- coplanar
- collinear

93 of 100

283 PU_2015_393

If **a** x **b** = **c**, **b** x **c** = **a**, then:-

- *c*=1, *a*=1
- *a*=1, *b*=*c*
- *b*=1, *c*=*a*
- *b*=2, *c*=2*a*

94 of 100

285 PU_2015_393

The work done by the force **F** = 2**i** – 3**j** + 2**k** in moving a particle from (3, 4, 5) to (1, 2, 3) is:-

- -4
- 0
- 3/2
- -2

95 of 100

271 PU_2015_393

If $f(x) = (x - x_0)g(x)$ where $g(x)$ is continuous at x_0, then $f'(x_0)$ is equal to

- 1
- $g(x_0)$
- x_0
- 0

96 of 100

293 PU_2015_393

The derivative of $\sin^{-1} x$ w.r.t $\cos^{-1} \sqrt{(1-x^2)}$ is:-

- 0
- $1/\sqrt{[(1-x^2)]}$
- $\cos^{-1} x$
- 1

97 of 100

267 PU_2015_393

If $\sin\theta + \cos\theta = 1$, then the value of $\sin 2\theta$ is

- 0

- 3/4
- 1
- 1/2

98 of 100

261 PU_2015_393

Equation of the diameter of the circle $x^2 + y^2 - 2x + 4y = 0$ which passes through the origin is:-

- $x - 2y = 0$
- $x + 2y = 0$
- $2x + y = 0$
- $2x - y = 0$

99 of 100

269 PU_2015_393

If $u = f(y - z,\ z - x,\ x - y)$ then $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} =$

- 3
- $\frac{\partial f}{\partial x} + \frac{\partial f}{\partial y} + \frac{\partial f}{\partial z}$
- 0
- 1/3

100 of 100

277 PU_2015_393

The area of the figure bounded by the curves $y = x + 1$ and $y = \cos x$ and x-axis is:-

- 1
- 0
- 1/3
- 2/3

Examination: **M.Tech. Environmental Engineering and Management**

Section 1 - Section 1

Question No.1 4.00

Bookmark

Whenever a system in equilibrium is disturbed the system will adjust itself in such a way that the effect of the change will be reduced or moderated. Who proposed this principle?

- Gibbs
- Le Chatelier
- Lowry
- Newton

Question No.2 4.00

Bookmark

Which of the following is used in the treatment of lead poisoning?

- EBT
- Zeise salt
- Cis platin
- EDTA

Question No.3 4.00

Bookmark

Montreal protocol is related to

- Ozone layer depletion
- Sustainable development
- Food security
- Global warming

Question No.4 4.00

Bookmark

Calculate $\lim x \rightarrow 1[(x^x - 1) / (x\log(x))]$ a) e^e

- 1
- 2
- 0
- -1

Question No.5 4.00

Bookmark

Choose the best antonym of the italicized word.
The task assigned to him was *arduous.*

- plain
- good
- easy
- absorbing

Question No.6 4.00

Bookmark

A right circular cone has a height of 40 cm and its semi vertical angle is 45^o, then its base circle radius is

- 80 cm
- 60 cm
- 20 cm
- 40 cm

Question No.7 4.00

Bookmark

Correct the error in the italicized part of the sentence by choosing the most appropriate option.
Whenever the two sisters *go out for shopping,* they take their pet dog with them.

- go out to shopping
- go out shopping
- go out on shopping
- go out of shopping

Question No.8 4.00

Bookmark

These poultry belong to Mr. Kishen, our new neighbor
The underlined word is a _____noun.

- proper
- collective
- common
- abstract

Question No.9 4.00

Bookmark

The organisms such as *Alexandrium fundyense , Alexandrium catenella , Karenia brevis* are all algal groups which could spread or be carried long distances by winds, currents, storms, or ships and they result in a phenomenon called as.

- Red tides
- Green waves
- Blue tides
- Oligotrophic lakes

Question No.10 4.00

Bookmark

The curve which represents the reduction in dissolved oxygen and the increase in biological oxygen demand in an aquatic ecosystem due to industrial effluent discharge is called as.

- BOD curve
- Oxygen sag curve
- Logarithmic curve
- Oxygenation curve

Question No.11 4.00

Bookmark

Identify the adverb in the following sentence:
We looked upwards and saw a bright shooting star

- shooting
- looked
- upwards
- bright

Question No.12 4.00

Bookmark

The Minamata Convention is an international treaty designed to protect human health and the environment from anthropogenic emissions and releases of a heavy metal namely -

- Iron
- Mercury
- Lead
- Chromium

Question No.13 4.00

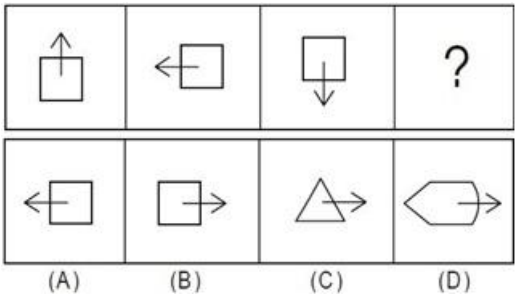
Bookmark

Rusting of iron in sea water is

- Slower due to the absence of electrolyte in sea water
- Slower due to the presence of electrolyte in sea water
- Rapid due to the presence of electrolyte in sea water
- Rapid due to the absence of electrolyte in sea water

Question No.14 4.00

Bookmark



- C
- B
- D
- A

Question No.15 4.00

Bookmark

Due to _____, the subways were closed all morning.

- its flooding
- floods
- are flooded
- flood

Question No.16 4.00

Bookmark

Following are the fundamental forces from which all other forces are derived

- Electromagnetic, physical and chemical
- Nuclear, gravitational and chemical
- Nuclear, gravitational and physical
- Electromagnetic, nuclear and gravitational

Question No.17 4.00

Bookmark

If a particle is moving in uniform circular motion, which of the following is true?

- $v = \omega r^2$
- There is no tangential acceleration
- Speed is not constant
- Velocity is constant

Question No.18 4.00

Bookmark

Which of the following is not a thermometer?

- Thermotube
- Thermocouple
- Thermistor
- Radiation thermometer

Question No.19 4.00

Bookmark

If $\tan\tau + ab\cot\tau = a + b$ then $\tan\tau =$

- a
- $\pi/4$
- b
- a or b

Question No.20 4.00

Bookmark

India's maiden Ocean Thermal Energy Conversion (OTEC) project planned for India to be executed by 2019, off the south-western coast after almost three and a half decades of initial plans.The place proposed for the same is

- Kavaratti,Lakshadweep
- Nicobar
- Cochin
- Andaman

Question No.21 4.00

Bookmark

Maximum potential is produced in a voltaic cell, when the two metals connected have

- Same standard reduction potential values
- Different standard reduction potential values
- Lesser difference in standard reduction potential values
- Greater difference in standard reduction potential values

Question No.22 4.00

Bookmark

Calculate the electronic polarizability of an argon atom whose εr = 1.0024 at NTP and N = 2.7×10^{25} atoms/m^3.

- $6.1\text{x}10^{40}Fm^2$
- $8.7\text{x}10^{40}Fm^2$
- $5.2\text{x}10^{40}Fm^2$
- $7.87\text{x}10^{40}Fm^2$

Question No.23 4.00

Bookmark

can posses a non-trivial solution then λ =

- 6
- 3
- 2
- 1

Question No.24 4.00

Bookmark

The mother gripped her child's arm_____ he be trampled.

- lest
- if not
- if
- unless

Question No.25 4.00

Bookmark

The enthalpy of formation of compounds A, B, C and D are -90, +25, +10, - 26 kJ/mol respectively.
The increasing order of stability of compounds is

- C < B < D < A
- A < D < C < B
- A < D < B < C
- B < C < D < A

Question No.26 4.00

Bookmark

Bristle : Brush

- Art: Sculpture
- Arm : Leg
- Stage: Chairs
- Key: Piano

Question No.27 4.00

Bookmark

Given the following entropy values (Al_2O_3 is 51.00; Al(s) is 28.32; $H_2O(g)$ is 188.7; $H_2(g)$ is 130.6), determine dS for the reaction:$Al_2O_3(s) + 3H_2(g) \rightarrow 2Al(s) + 3H_2O(g)$

- 179.9K
- 17.99J/K
- 179.9J/K
- 179.9J

Question No.28 4.00

Bookmark

Find lt $(x,y,z,w) \rightarrow (0,0,0,0)$ $x^{-6}.y^{2}.(z.w)^{3}/x+y^{2}+z-w$

- ∞
- Does Not Exist
- 900
- 0

Question No.29 4.00

Bookmark

The probability that at least one of the events M and N occur is 0.6. If M and N have probability of occurring together as 0.2, then P(~M) + P(~N) is

- 3
- 1.2
- 2
- 1

Question No.30 4.00

Bookmark

Find the area of a function $f(x) = x^2 + xCos(x)$ from x = 0 to a, where , a>0

- $a^3/_3 + Cos(a) + Sin(a) - 1$
- $a^3/_3 + aSin(a) + Cos(a)$
- $a^3/_3 + aSin(a) + Cos(a) - 1$
- $a^2/_2 + aSin(a) + Cos(a) - 1$

Question No.31 4.00

Bookmark

The graph in the xy plane represented by $x = 3 + 2 \sin t$ and $y = 2 \cos t - 1$, for $-\pi \leq t \leq \pi$ is

- half of an ellipse
- a semicircle
- a circle
- an ellipse

Question No.32 4.00

Bookmark

A hose lying on the ground has water coming out of it at a speed of 5.4 meters per second. You lift the nozzle of the hose to a height of 1.3 meters above the ground. At what speed does the water now come out of the hose?

- 1.0m/s
- 0.6m/s
- 1.9m/s
- 0.9m/s

Question No.33 4.00

Bookmark

When gas expands into vacuum,

- Work is done on the gas
- No work is done
- Work is done by the gas
- Work done by the gas is maximum

Question No.34 4.00

Bookmark

On the interval $1 < x < 2$, f(x)equals

- -x-2
- -x-4
- -x+2
- -x-3

Question No.35 4.00

Bookmark

How is charge carriers produced in intrinsic semiconductors?

- By impure atoms
- By holes
- By electrons
- By pure atoms

Question No.36 4.00

Bookmark

Rachel Carson's book, first published in 1962, alerted readers to how the widespread use of chemical pesticides was posing a serious threat to public health and leading to the destruction of wildlife. The title of the book is

- Population bomb
- Desert Solitaire
- The end of nature
- Silent Spring

Question No.37 4.00

Bookmark

Reduction in fluid pressure that results when a fluid flows through a constricted section of a pipe

- Viscosity effect
- Venturi effect
- Bernoulli effect
- Pascal effect

Question No.38 4.00

Bookmark

Based on the information given, answer the below question.
1. A,B,C,D,E and F are travelling in a bus.
2. There are two reporters, two mechanics, one photographer and one writer in the group.
3. Photographer A is married to D who is a reporter.
4. The writer is married to B who is of the same profession as that of F.
5. A,B,C,D are two married couples and no one in this belong to the same profession.
6. F is the brother of C.

Which of the following is the pair of reporters?

- DE
- Cannot be determined
- DF
- AE

Question No.39 4.00

Bookmark

The internal energy of an ideal gas does not change if volume and pressure change, but does change if temperature changes.

- Bernoulli's second law
- Bernoulli's first law
- Joule's first law
- Joule's second law

Question No.40 4.00

Bookmark

X is twice as good a workman as Y and together they finish a piece of work in 18 days. In how many days will X alone finish the work?

- 26
- 28
- 27
- 25

Question No.41 4.00

Bookmark

If a 2.34 g substance at 22^{o}C with a specific heat of 3.88 cal/g-^{o}C is heated with 124 cal of energy, what is the new temperature of the substance?

- 3.57^{o}C
- 30.7^{o}C
- 25.7^{o}C
- 35.7^{o}C

Question No.42 4.00

Bookmark

An organic compound (A) with molecular formula $C_8H_{16}O_2$ was hydrolyzed with dilute sulphuric acid to give a carboxylic acid (B) and an alcohol (C). Oxidation of C with chromic acid also produced B. On dehydration, C gives but-2-ene. What is A?

- Alcohol
- Ketone
- Ester
- Ether

Question No.43 4.00

Bookmark

Assertion: Crude oil is abundantly found in nature

Reason: It is the main raw material for all automobiles

- Both A and R are true and R is the correct explanation of A
- Both A and R are true and R is not the correct explanation of A
- A is false but R is true
- A is true but R is false

Question No.44 4.00

Bookmark

If length of an arc is 52 cm and θ is 45^o, radius should be

- 56cm
- 55cm
- 60cm
- 66.21cm

Question No.45 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 is to the immediate left of Aasha?

- Bhuvnesh
- Aasha
- Charan
- Ganesh

Question No.46 4.00

Bookmark

For the function $f(x) = \sin(x)/x^2$ How many points exist in the interval $[0, 7\pi]$ Such that $f'(c) = 0$

- 8
- 5
- 7
- 6

Question No.47 4.00

Bookmark

Which one of the following soil is the least porous?

- peaty
- silty
- loamy
- clayey

Question No.48 4.00

Bookmark

Consider the vertical cone. The minimum value of the function in the region f(x,y) = c is

- 1
- 0
- -1
- Constant

Question No.49 4.00

Bookmark

Surface tension of sea water is --------- that of fresh water.

- Equal to
- Lesser than
- Higher than
- Not related to

Question No.50 4.00

Bookmark

Which of the following solution is an example for acidic buffer

- Ammonium hydroxide and ammonium chloride
- Ammonia and ammonium chloride
- Ethanoic acid and sodium ethanoate
- Ethanoic acid and hydrochloric acid

Question No.51 4.00

Bookmark

Which of the following mentioned standard Probability density functions is applicable to discrete Random Variables ?

- Rayleigh Distribution
- Poisson distribution
- Gaussion Distribution
- Exponential Distribution

Question No.52 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

Which of the above statements is unnecessary?

- (ii)
- (iv)
- (iii)
- Nill

Question No.53 4.00

Bookmark

If 50 joules of energy is supplied in 5 seconds, the power produced is

- 1 Watt
- 25 Watts
- 5 Watts
- 10 Watts

Question No.54 4.00

Bookmark

The law which is an explicit formula for the solution of a system of linear equations with as many equations as unknowns, valid whenever the system has a unique solution is termed as

- Associative law
- Commutative law
- Distributive law
- Cramer's rule / law

Question No.55 4.00

Bookmark

Value of $\lim_{x \to 0}(1+\text{Sin}(x))^{\text{Cosec}(x)}$

- -1
- 0
- 1
- e

Question No.56 4.00

Bookmark

Which of the following is not an aminoacid?

- Serine
- Aspartic acid
- Proline
- Terephthalic acid

Question No.57 4.00

Bookmark

What will happen to the rate of an Exothermic reaction when the temperature is decreased?

- increases
- decreases
- No change
- None of the above

Question No.58 4.00

Bookmark

$\tan^{-1}(\tan 4) - \tan^{-1}(\tan(-6)) + \cos^{-1}(\cos 10) =$

- 16
- π
- $5\pi-12$
- $-\pi$

Question No.59 4.00

Bookmark

The acronym CSR stands for

- Corporate Social Reality
- Corporate Sensitive Reliability
- Corporate Search and Rescue
- Corporate Social Responsibility

Question No.60 4.00

Bookmark

Which solid will precipitate first if an aqueous solution of Na_2CrO_4 at 25°C is slowly added to an aqueous solution containing 0.001 M $Pb(NO_3)_2$ and 0.100 M $Ba(NO_3)_2$ at 25°C?

- $NaNO_3$
- $PbCrO_4$
- $BaCrO_4$
- $Pb(NO_3)_2$

Question No.61 4.00

Bookmark

Anand is heavier than Gopal.Mohan is lighter than Jagan.Pandian is heavier than Jagan but lighter than Gopal. Who is the heaviest of all ?

- Jagan
- Pandian
- Anand
- Gopal

Question No.62 4.00

Bookmark

A gardener pushes a lawn roller through a distance of 20m. If he applies a force of 20kg weight in a direction inclined at 60° to the ground, find the work done by him. ($g=9.8m/s^2$)

- 1960 joules
- 19 joules
- 160 joules
- 196 joules

Question No.63 4.00

Bookmark

Choose the missing term: SHG, RIF, QJE, PKD, ?

- NMD
- MLB
- OLC
- OLD

Question No.64 4.00

Bookmark

A theorem in fluid dynamics relating the speed of fluid flowing out of an orifice to the height of fluid above the opening

- Torricelli theorem
- Bernoulli theorem
- Pascal theorem
- Archimedes theorem

Question No.65 4.00

Bookmark

Study the following information carefully and answer the question below it

The Director of an MBA college has decided that six guest lectures on the topics of Motivation, Decision Making, Quality Circle, Assessment Centre, Leadership and Group Discussion are to be organised on each day from Monday to Sunday.
(i) One day there will be no lecture (Saturday is not that day), just before that day Group Discussion will be organised.
(ii) Motivation should be organised immediately after Assessment Centre.
(iii) Quality Circle should be organised on Wednesday and should not be followed by Group Discussion
(iv) Decision Making should be organised on Friday and there should be a gap of two days between Leadership and Group Discussion

Which of the pairs of lectures were organised on first and last day?

- Quality Circle and Motivation
- Group Discussion and Quality Circle
- Group Discussion and Decision Making
- None of these

Question No.66 4.00

Bookmark

For a reaction A + B → Product, the rate law is given by $r = K [A]^{1/2} [B]^2$. What is the order of the reaction?

- 1
- 2.5
- 1.5
- 2

Question No.67 4.00

Bookmark

The third international conference on sustainable development aimed at reconciling the economic and environmental goals of the global community.This conference is called as

- Earth Summit 2012
- Kyoto meet
- Montreal meet
- IPCC

Question No.68 4.00

Bookmark

As per Earth system research laboratory's report of March 2018, the global CO_2 level in the atmosphere has passed about

- 600ppm
- 300 ppm
- 400ppm
- 200ppm

Question No.69 4.00

Bookmark

The process that uses electric current to reduce the dissolved metal cations so that they form a thin coherent metal coating on an electrode is called as.

- reduction
- Coating
- Deposition
- Electroplating

Question No.70 4.00

Bookmark

Liquid water at 100^{o}c and 1 bar has an internal energy(on an arbitrary scale) at 460KJ/Kg and a specific volume of 1.044 cm^3/g. Calculate the enthalpy.

- 406.1044
- 46.01044
- 460.1044
- 40610.44

Question No.71 4.00

Bookmark

The clouds in the winter polar stratosphere at altitudes of 15,000–25,000 meters (49,000–82,000 ft) which are best observed during civil twilight when the sun is between 1 and 6 degrees below the horizon as well as in winter and in more northerly latitudes which are implicated in the formation of ozone holes are called

- cirrostratus
- cirrus
- cirrocumulus
- nacreous clouds

Question No.72 4.00

Bookmark

A 2 kg ball on a string is rotated about a circle of radius 10 m. The maximum tension allowed in the string is 50 N. What is the maximum speed of the ball?

- 15.4 m/s
- 13.8 m/s
- 12.8 m/s
- 15.8 m/s

Question No.73 4.00

Bookmark

If the system of equations $x + ky + 3z = 0$, $3x + ky - 2z = 0$, $2x + 3y - 4z = 0$ has non-trivial solution, then $xy/z^2 =$

- -5/6
- 5/6
- 6/5
- -6/5

Question No.74 4.00

Bookmark

The increase in internal energy of a system is equal to the work done in the system. Which process does the system undergo?

- adiabatic
- Isobaric
- Isothermal
- Isochoric

Question No.75 4.00

Bookmark

A solution of $CuSO_4$ is electrolyzed for 600 s with a current of 1.5 A. The mass of Cu deposited at the cathode is

- 2.938 g
- 2.938 mg
- 0.2938 g
- 0.2938 mg

Question No.76 4.00

Bookmark

The outer ends of two bars A and B are at 100^{o}C and 50^{o} respectively. Calculate the temperature at the welded joint if they have the same cross-section and the same length and their thermal conductivities are in the ratio of A:B = 7:5

- 78.166^{o}C
- 79.166^{o}C
- 89.166^{o}C
- 77.166^{o}C

Question No.77 4.00

Bookmark

The equations x + 2y + 3z = 1, 2x + y + 3z = 2, 5x + 5y + 9z = 4 have

- No solution
- Unique solution
- Infinity solutions
- Cannot say anything

Question No.78 4.00

Bookmark

The rate constant unit of a zero order reaction is

- $Mol\,l^{-1}\,s^{-1}$
- s^{-1}
- $Mol^{-1}\,s^{-1}$
- $Mol^{-1}\,l\,s^{-1}$

Question No.79 4.00

Bookmark

The by-product in the working of the Hydrogen-oxygen fuel cell is

- ethanol
- methanol
- Water
- CO_2

Question No.80 4.00

Bookmark

The temperature at which a real gas obeys the ideal gas laws at fairly wide range of pressure is called as

- Critical temperature
- Boyle's temperature
- Inversion temperature
- Constant temperature

Question No.81 4.00

Bookmark

How many points of discontinuity does f '(x) have on the interval -6 < x < 7?

- 3
- 5
- 2
- 4

Question No.82 4.00

Bookmark

The maximum lift provided by a 700 kg airplane is 10000 N. If the plane travels at 100 m/s, what is its shortest possible turning radius?

- 700
- 600
- 70
- 7000

Question No.83 4.00

Bookmark

The organisms which may benefit from higher CO_2 conditions in the ocean, as they require CO_2 to live just like plants on land are namely.

- oysters, clams
- deep sea corals, and calcareous plankton
- sea urchins, shallow water corals
- Photosynthetic algae and seagrasses

Question No.84 4.00

Bookmark

Choose the best synonym of the italicized word.
Reena has an *insatiable* love for music.

- unchanging
- unquenchable
- undesirable
- irreconcilable

Question No.85 4.00

Bookmark

Which of the following are used in food preservation?

- Ethanoic acid and methanoic acid
- Sodium benzoate and ethanoic acid
- Acetic acid and benzoic acid
- Sodium benzoate and methanoic acid

Question No.86 4.00

Bookmark

The Navier–Stokes equations form a vector continuity equation describing the conservation of

- Angular velocity
- Linear velocity
- Linear momentum
- Angular momentum

Question No.87 4.00

Bookmark

As a country, the United States is _____ that there are five time zones.

- too big
- very big
- much big
- so big

Question No.88 4.00

Bookmark

To how many places is the symmetric difference accurate when it is used to approximate f ' (0) for f (x) = 4' and h = 0.08?

- 4
- 2
- 1
- 3

Question No.89 4.00

Bookmark

The maximum number of points into which 4 circles and 4 straight lines intersect is

- 56
- 26
- 72
- 50

Question No.90 4.00

Bookmark

A gas occupies one litre under atmospheric pressure. What will be the volume of the same amount of gas under 730 mm of Hg at the same temperature?

- 141.1L
- 141.1mL
- 1041.1L
- 1041.1mL

Question No.91 4.00

Bookmark

Alpha diversity means

- Genetic diversity
- Species diversity
- Diversity among plants
- Community and ecosystem diversity

Question No.92 4.00

Bookmark

$\sin^{-1}(\sin 10)$ is

- $10-3\pi$
- $3\pi-10$
- $2\pi-10$
- 10

Question No.93 4.00

Bookmark

Species are classified by the IUCN Red List into nine groups. As per this classification, CR refers to

- Known only to survive in captivity
- Extremely high risk of extinction in the wild
- Likely to become endangered in the near future
- High risk of endangerment in the wild

Question No.94 4.00

Bookmark

What is the n-factor of H_3PO_3?

- 3
- 2
- -1
- 0

Question No.95 4.00

Bookmark

Under sub-adiabatic conditions (ELR < ALR), there exists limited vertical mixing and environment is slightly stable, the plume which is not suitable for dispersion of pollutants. Such plume is called as

- Coning plume
- Fanning plume
- Looping plume
- Neutral plume

Question No.96 4.00

Bookmark

Which of the following is not an effect of electric current?

- Physical effect
- Heating effect
- Magnetic effect
- Chemical effect

Question No.97 4.00

Bookmark

If Milk is water, water is sugar, sugar is road, road is sky and sky is track where do aeroplanes fly?

- Sky
- Road
- Sugar
- Milk

Question No.98 4.00

Bookmark

In the following question, the first two words (given in italics) have a definite relationship. Choose one word out of the given four alternatives which will fill the blank space and showthe same relationship with the third word as between the first two.

Truthfulness is to *Liar* as *Loyalty* is to ……?…….

- Falsehood
- Traitor
- Worker
- Devotion

Question No.99 4.00

Bookmark

Find the standard Gibbs energy change for the reaction

$$CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$$

The ΔG_f° values for the three components of this reaction system are $CaCO_3(s)$: $-1128\ kJ\ mol^{-1}$, $CaO(s)$: $-603.5\ kJ\ mol^{-1}$, $CO_2(g)$: $-137.2\ kJ\ mol^{-1}$.

- 300.3KJ mol^{-1}
- 387.3KJ mol^{-1}
- 87.3KJ mol^{-1}
- 307.3KJ mol^{-1}

Question No.100 4.00

Bookmark

Angles between 0^o and 90^o lies in

- 2nd quadrant
- 3rd quadrant
- 4th quadrant
- 1st quadrant

Sr No.	MTech Environmental Engineering and Management
1	Which term will replace the question mark in the series: ABD,DGK,HMS,MTB,SBL, ?
Alt1	ZKU
Alt2	ZKW
Alt3	ZAB
Alt4	XKW

2	Choose word from the given options which bears the same relationship to the third word, as the first two bears: Illiteracy: Education:: Flood:?
Alt1	Rain
Alt2	Bridge
Alt3	Dam
Alt4	River

3	Select the lettered pair that has the same relationship as the original pair of words: Sip : Gulp
Alt1	Touch: Push
Alt2	Cup: Class
Alt3	Tent: Hut
Alt4	Soup: Water

4	Select the lettered pair that has the same relationship as the original pair of words: Low : Cattle
Alt1	Sheep: Beef
Alt2	Gaggle: Chicken
Alt3	Grunt: Hogs
Alt4	Flock: Goat

5	Find out the number that has the same relationship as the numbers of the given pair: 8 : 81 : : 64 : ?
Alt1	125
Alt2	137
Alt3	525
Alt4	625

6	Spot the defective segment from the following:
Alt1	It's time
Alt2	the students dispersed
Alt3	to go to home
Alt4	after study hours

7	There is no -------- in our car and it is already crowded.
Alt1	room
Alt2	place
Alt3	seat

Alt4	space

8	Newton ---------- loved his pet dog very much.
Alt1	a scientist
Alt2	the scientist
Alt3	scientist
Alt4	one scientist

9	Choose the option closest in meaning to the given word: JINGOISM
Alt1	deism
Alt2	chauvinism
Alt3	extremism
Alt4	pacifism

10	Choose the antonymous option you consider the best: QUACK
Alt1	bizarre
Alt2	procurer
Alt3	charlatan
Alt4	authority

11	In a village there are 1000 persons. Out of which 800 are literates. Out of 1000,700 are criminals. There are 550 literate criminals in that village. How many Illiterate non criminals are there?
Alt1	150
Alt2	250
Alt3	50
Alt4	200

12	Average weight of A,B,C is 45; Average weight of A&B is 40; Average weight of B&c is 43, Weight of B is
Alt1	17
Alt2	20
Alt3	26
Alt4	31

13	Which of the following cannot be the Median of the three positive Integers X,Y & Z ?
Alt1	X
Alt2	Z
Alt3	X+Z
Alt4	(X+Z)/3

14	How many Zero's are there in the product 1*2*3*------*10
Alt1	2
Alt2	10
Alt3	5

Alt4	6

15	A,B,C,D work on a project. Together A,B &C can complete in 100 days; Together B,C &D can complete in 101 days; Together C,D & A can complete in 102 days; together D,A & B can complete in 103 days . Rank them from the best to the worst performer.
Alt1	C>B>A>D
Alt2	C>A>B>D
Alt3	D>B>A>C
Alt4	D>A>B>C

16	22 Students are evenly spaced on the circumference of a big circle. They are numbered 1to 22. which number is opposite to 17?
Alt1	8
Alt2	5
Alt3	7
Alt4	6

17	The fare of a luxury cab is Rs. X for the first five Kilometres and Rs,13/- per Kilometre thereafter. If a passenger pays Rs.2402/- for a journey of 187 kilometres, what is the value of X ?
Alt1	Rs.29
Alt2	Rs.39
Alt3	Rs.36
Alt4	Rs.31

18	An HR Company employs 4800 people out of which 45 per cent are males and 60 per cent of males are either 25 years or older. How many males are employed in that company who are younger than 25 years ?
Alt1	2640
Alt2	2160
Alt3	1296
Alt4	864

19	A person buys a shirt with marked price Rs.400/- at 20% discount. In order to make a profit of 20% the person should sell the shirt for
Alt1	Rs.400/-
Alt2	Rs.384/-
Alt3	Rs.320/-
Alt4	Rs.480/-

20	The following information is given:(i) Five friends P, Q, R. S and T travelled to five different cities of Chennai, Calcutta, Delhi, Bangalore and Hyderabad by five different modes of transport of Bus, Train, Aeroplane, Car and Boat from Mumbai. (ii) The person who travelled to Delhi did not travel by boat. (iii) R went to Bangalore by car and Q went to Calcutta by aeroplane.(iv) S travelled by boat whereas T travelled by train. (v) Mumbai is not connected by bus to Delhi and Chennai. Which of the following combinations of place and mode is not correct ?

Alt1	Delhi — Bus
Alt2	Calcutta — Aeroplane
Alt3	Bangalore — Car
Alt4	Chennai — Boat

21	Which of the following is a dimensionless quantity?
Alt1	Stress
Alt2	Quantity of heat
Alt3	Strain
Alt4	Specific heat

22	The physical quantities, not having the same dimensions, are:-
Alt1	Momentum and Planck's constant
Alt2	Torque and work
Alt3	Strain and coefficient of friction
Alt4	Stress and Young's Modulus

23	If curve y = x2 + bx + c touches the straight line y = x a the point (1, 1), then b and c are given by:-
Alt1	1, 1
Alt2	-1, 1
Alt3	2, 1
Alt4	1, 2

24	Suppose the sun expands, so that its radius becomes 100 times its present radius and its surface temperature becomes half of its present value. The total energy emitted by it will increase by a factor of:-
Alt1	16
Alt2	1000
Alt3	256
Alt4	625

25	A particle is moving in a straight line according to the formula s=t3-9t2+3t+1, Where s is measured in metres and t in seconds. When the velocity is -24 m/s, the acceleration is:-
Alt1	-36 m/s2
Alt2	0 m/s2
Alt3	48 m/s2
Alt4	36 m/s2

26	The greatest value of f(x)=2x3-3x2-12x+1 in the interval [-2, 5] is:-
Alt1	8
Alt2	114
Alt3	108
Alt4	121

27	Maximum area of a rectangle of perimeter 176 cm is:-
Alt1	1936 cm2
Alt2	2110 cm2

Alt3	1854 cm2
Alt4	3600 cm2

28	The transmission of heat by molecular collision is called:-
Alt1	Radiation
Alt2	Convection
Alt3	Condensation
Alt4	Conduction

29	Air pollution is not caused by:-
Alt1	hydroelectric power
Alt2	industries
Alt3	pollen grains
Alt4	automobiles

30	$\int_2^4 \frac{dx}{\sqrt{\{(x-2)(4-x)\}}} =$
Alt1	1
Alt2	π /2
Alt3	0
Alt4	π

31	If two compounds have the same empirical formula but different molecular formulae, they must have :-
Alt1	same viscosity
Alt2	same vapour density
Alt3	different molecular weights
Alt4	different % composition

32	Which of the following is not a reducing agent?
Alt1	NO2
Alt2	CO2
Alt3	H2O2
Alt4	SO2

33	If energy (E), velocity (v) and force (F) be taken as fundamental quantity, then what are the dimensions of mass ?
Alt1	E v2
Alt2	E v-2
Alt3	F v-1
Alt4	F v-2

34	The process which is catalyzed by one of the products is known as:-
Alt1	negative catalysis

Alt2	auto-catalysis
Alt3	anti-catalysis
Alt4	acid catalysis

35	A car moves along a straight line whose motion is given by S = 12t + 3 t2- 2t3, where (s) is in meters and (t) is in seconds . The velocity of the car at start will be:-
Alt1	9 m/sec
Alt2	12 m/sec
Alt3	16 m/sec
Alt4	7 m/sec

36	“Parsec” is the unit of:-
Alt1	Angular momentum
Alt2	Distance
Alt3	Time
Alt4	Frequency

37	A stone is released from the top of a tower, reaches the ground in 4 sec. The height of the tower is (g = 10m/sec2) :-
Alt1	160 m
Alt2	20 m
Alt3	40 m
Alt4	80 m

38	Disease caused by eating fish found in water contaminated with industrial waste having mercury is:-
Alt1	osteosclerosis
Alt2	hasimatos disease
Alt3	brights disease
Alt4	minamata disease

39	Transition elements are hard because of :-
Alt1	Vander Waal's forces
Alt2	ionic bonds
Alt3	covalent bonds
Alt4	hydrogen bonds

40	“If external force on a body is zero, its acceleration is also zero” is a statement or consequence of the:-
Alt1	Newton's second law of motion
Alt2	Newton's first law of motion
Alt3	First Law of thermodynamics
Alt4	Newton's thirds law of motion

41	Which of the following is a good conductor of electricity?
Alt1	graphite
Alt2	diamond

Alt3	amorphous carbon
Alt4	silicon

42	A particle is moving on a line, where its position s in metres is a function of time t in seconds given by s=t3 + at2 + bt + c, where a, b, c are constants. It is known that at t=1 seconds, the position of the particle is given by s=7 m, velocity is 7 m/s and acceleration is 12 m/s2. The values of a, b, c are
Alt1	3, 2, 1
Alt2	3, -2, 5
Alt3	-3, 2, 7
Alt4	3, 2, -1

43	Locus of a point such that the ratio of its distances from two fixed points is constant is:
Alt1	a straight line
Alt2	a parabola
Alt3	an ellipse
Alt4	a circle

44	Which one of the following is a molecular crystal?
Alt1	quartz
Alt2	diamond
Alt3	dry ice
Alt4	rock salt

45	The error in the measurement of mass and velocity of a moving body are 2% and 3 % respectively. Error , in kinetic energy obtained by measuring mass and speed ,will be:-
Alt1	0.08
Alt2	0.02
Alt3	0.12
Alt4	0.1

46	A 100m long train is moving with uniform velocity of 45 km/hr. The time taken by the train to cross a bridge of length 1 km is:-
Alt1	68 sec
Alt2	78 sec
Alt3	88 sec
Alt4	58 sec

47	The ratio of Hydrogen and Oxygen in water molecule by volume is:-
Alt1	0.084027778
Alt2	0.167361111
Alt3	0.043055556
Alt4	0.125694444

48	Which of the following is not a characteristic of the fundamental units?
Alt1	They change with change of conditions
Alt2	They are easily reproductive
Alt3	They are well defined

Alt4	They are not related to each other

49	The tangent to the curve y = e2x at the point (0, 1) meets the x-axis at:-
Alt1	(0,-1/2)
Alt2	(0, 2)
Alt3	(-1/2, 0)
Alt4	(2, 0)

50	A line passes through (2, 2) and is perpendicular to the line 3x+y=3. Its y intercept is:-
Alt1	4/3
Alt2	1/3
Alt3	1
Alt4	2/3

51	Bleaching action of chlorine in presence of moisture is:-
Alt1	reduction
Alt2	substitution
Alt3	oxidation
Alt4	hydrolysis

52	Lead in water may cause:-
Alt1	arthritis
Alt2	hair falling
Alt3	fever
Alt4	kidney damage

53	Hess's law deals with:-
Alt1	rates of reaction
Alt2	change in heat of a reaction
Alt3	influence of pressure on volume of a gas
Alt4	equilibrium constants

54	World Ozone day is celebrated on:-
Alt1	March 16
Alt2	June 16
Alt3	December 16
Alt4	September 16

55	$\text{If } u = f(y-z,\ z-x,\ x-y) \text{ then } \frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} =$
Alt1	3
Alt2	0
Alt3	1

Alt4	$\frac{\partial f}{\partial x}+\frac{\partial f}{\partial y}+\frac{\partial f}{\partial z}$

56	If (x,y,z)=(x2+y2+z2)-1/2, then fxx+fyy+fzz=
Alt1	∞
Alt2	-1
Alt3	0
Alt4	1

57	The product of the roots of the equation mx2 + 6x + (2m - 1) = 0 is -1. Then m =
Alt1	-1/3
Alt2	1/3
Alt3	1
Alt4	-1

58	The three fundamental quantities are:-
Alt1	Mass, length and time
Alt2	Mass, force and length
Alt3	Mass, pressure and energy
Alt4	Momentum, force and torque

59	The positive values of a which satisfies:- $\int_0^a (3x^2+4x-5)dx = a^3-2$, are
Alt1	1, 2
Alt2	2, 1/2
Alt3	1, -2
Alt4	2, -1/2

60	The principal quantum number of an atom represents:-
Alt1	orbital angular momentum
Alt2	spin angular momentum
Alt3	size of the orbital
Alt4	space orientation of the orbital

61	Entropy of the Universe is:-
Alt1	zero
Alt2	continuously increasing
Alt3	constant
Alt4	continuously decreasing

62	A catalyst in the finely divided form is most effective because:-

Alt1	more energy gets stored in the catalyst
Alt2	more active centres are formed
Alt3	less surface area is available
Alt4	none

63	The value of a for which the difference of the roots of the equation ax2+(a-1)x+2=0 is min, is given by:-
Alt1	5
Alt2	1/5
Alt3	-1/5
Alt4	-5

64	Argon is used:-
Alt1	in radiotherapy for treatment of cancer
Alt2	in filling airships
Alt3	to obtain low temperature
Alt4	in high temperature welding

65	The numerical ratio of displacement to the distance covered by a particle is always:-
Alt1	Equal to or less than one
Alt2	Less than one
Alt3	Equal to one
Alt4	Equal to or greater than one

66	A U- tube contains water and methylated spirit separated by mercury. The mercury columns in the two arms are in level with18 cm of water in one arm and 20 cm in other arm. The density of spirit is (density of water 1g/cm3).
Alt1	1.2 g/cm3
Alt2	0.3 g/cm3
Alt3	0.9 g/cm3
Alt4	0.6 g/cm3

67	From a solution of CuSO4, the metal used to recover copper is:-
Alt1	Sodium
Alt2	Silver
Alt3	Iron
Alt4	Mercury

68	If y=axn+1 + bx-n, then $x^2 \frac{d^2y}{dx^2} =$
Alt1	n(n+1)y
Alt2	n(n-1)y
Alt3	ny
Alt4	n2y

69	A tree is broken by wind, its upper part touches the ground at appoint 10 m from the foot of the tree and makes an angles of 45° with the ground. The entire length of the tree is:-
Alt1	10 (1+√3/2) metres
Alt2	10 (1+√2) metres
Alt3	15 metres
Alt4	20 metres

70	Solution of the differential equation (dy/dx) + (y/x) = sin x is:-
Alt1	x(y - cos x) = sin x + c
Alt2	x(y + cos x) = cos x + c
Alt3	x(y + cos x) = sin x + c
Alt4	x(y + cos x) = -sin x + c

71	The Value of $\int_0^{\pi/2} \frac{dx}{1+\tan^3 x}$ is:-
Alt1	π/2
Alt2	1
Alt3	π/4
Alt4	0

72	The line which is parallel to x-axis and crosses the curve y = √x at an angle of 45° is:-
Alt1	y = 1
Alt2	y = 1/4
Alt3	y = 1/2
Alt4	x = 1/4

73	$\int_0^{2/3} \frac{dx}{4+9x^2} =$
Alt1	π/6
Alt2	π/48
Alt3	π/12
Alt4	π/24

74	When 100ml of 1M NaOH and 10ml of 1 N H2SO4 solution are mixed together the resulting solution will be:-
Alt1	acidic
Alt2	strongly acidic
Alt3	neutral
Alt4	alkaline

75	Temporary hardness can be removed by adding:-
Alt1	O2
Alt2	lime
Alt3	slaked lime
Alt4	Carbon

76	Nascent hydrogen consists of:-
Alt1	solvated protons
Alt2	Hydrogen ions in excited state
Alt3	Hydrogen molecules with excess energy
Alt4	Hydrogen atom with excess of energy

77	If thermal conductivity of a conductor is 4, then its thermal resistivity will be:-
Alt1	4
Alt2	1
Alt3	16
Alt4	0.25

78	In a DABC, if $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$, and the side $a = 2$, then the area of the triangle is:-
Alt1	1
Alt2	√3/2
Alt3	√3
Alt4	2

79	A spherical balloon is being inflated so that its volume increases uniformly at the rate of 40 cm3/min. When radius is 8 cm, the surface area is increasing at the rate:-
Alt1	100 cm2/min
Alt2	10 cm2/min
Alt3	400 cm2/min
Alt4	1 cm2/min

80	Two insulated charged copper sphere A and B each having charge of 6.5 x 10-7C are separated by a distance 50 cm. If they are placed in water of dielectric constant 80, then electrostatic force of repulsion between them is:
Alt1	1.9 x 10-4 N
Alt2	3.8 x 10-4 N
Alt3	3.8 x 10-7 N
Alt4	1.9 x 10-7N

81	In a brown ring test, the brown colour of the ring is due to:-
Alt1	ferrous nitrite
Alt2	nitroso ferrous sulphate

Alt3	ferrous nitrate
Alt4	mixture of NO and NO2

82	A metal plate of area 103 cm2 rest on a layer of oil 6 mm thick. A tangential force of 10-2N is applied on it to move it with a constant velocity of 6 cm/sec. The coefficient of viscosity of the liquid is:-
Alt1	0.9 P
Alt2	0.5 P
Alt3	0.1 P
Alt4	0.7 P

83	A sheet of aluminium foil of negligible thickness is introduced between the plates of a capacitor. The capacitance of the capacitor:-
Alt1	Remains unchanged
Alt2	Decreases
Alt3	Increases
Alt4	Becomes infinite

84	The Value of $\frac{d}{dx}(x^x)$ is
Alt1	xx log x
Alt2	x log x
Alt3	xx log ex
Alt4	x xx-1

85	If doubling the concentration of a reactant A increases the rate 4 times and trebling the concentration of A increases the rate 9 times, the rate is proportional to:-
Alt1	square of concentration of A
Alt2	cube of concentration of A
Alt3	underoot of concentration of A
Alt4	concentration of A

86	The value of a so that f(x)=sin2ax/x2,x≠0,f(0)=1, is continuous at x=0 is:-
Alt1	only -1
Alt2	only 1
Alt3	±1
Alt4	0

87	The metal always found in the free state is:-
Alt1	gold
Alt2	copper
Alt3	sodium
Alt4	silver

88	A carnot engine has an efficiency of 25%. If energy is fed into the engine at the rate of 1 kw , then output of the engine is:-
Alt1	750 W
Alt2	1250 W
Alt3	40 W
Alt4	250 W

89	Air is streaming over both the aeroplane wings such that its speed is 85 m/sec over the upper surface and 75 m/sec at the lower surface. If the wings are 10m long and have an average width of 2m, then lift of wind on aeroplane is (take density of air : 1.5 kg/m3)
Alt1	12 kN
Alt2	72 kN
Alt3	24 kN
Alt4	48 kN

90	If a reversible engine and an irreversible engine are operating between the same temperature, then efficiency of:-
Alt1	Both the engines will be 100%
Alt2	Irreversible engine will be greater
Alt3	Reversible engine will be 100%
Alt4	Reversible engine will be greater

91	If x = sin θv(cos 2θ), y = cos θV (sin 2θ), then dy/dx at θ = π/4 is:-
Alt1	-1
Alt2	0
Alt3	1
Alt4	∞

92	When solid potassium cyanide is added in water, the:-
Alt1	the pH will increase
Alt2	electrical conductivity will not change
Alt3	the pH will decrease
Alt4	pH will remain same

93	The metallic lusture exhibited by sodium is explained by:-
Alt1	oscillation of loose electrons
Alt2	diffusion of Na+ions
Alt3	excitation of free protons
Alt4	existence of body centred cubic lattice

94	If the equations x2 + 2x + 3λ = 0 and 2x2 + 3x + 5λ = 0 have a non-zero common root, then λ =
Alt1	1
Alt2	-1
Alt3	-3
Alt4	3

95	The value of y”(1), when x3-2x2y2=5x=y-5=0 and y(1)=1, is given by:-

Alt1	-238/27
Alt2	22/27
Alt3	-182/23
Alt4	8

96	A circle is inscribed in a triangle with sides 8 cm, 15 cm and 17 cm. The radius of the circle is:-
Alt1	6 cm
Alt2	5 cm
Alt3	3 cm
Alt4	2 cm

97	$\int x^2 e^x \cos(e^x)dx =$
Alt1	$\frac{1}{3}\sin(e^x)$
Alt2	$\mathrm{Sin}(e^{x^3})$
Alt3	$3\sin(e^{x^3})$
Alt4	$-\frac{1}{3}\sin(e^{x^3})$

98	If the pressure of 250 cc of dry oxygen measured at 700 mm and at constant temperature be raised to 875 mm, then volume occupied by the gas will be:-
Alt1	200 cc
Alt2	100 cc
Alt3	300 cc
Alt4	400 cc

99	Solution of the equation dy/dx+(1/x) y=x2y6 is:-
Alt1	$s^5y^5=\frac{5}{2}x^2+c$
Alt2	xy=c
Alt3	$x^5/y^5=5x^2+c$
Alt4	$1/(x^5y^5)=5/(2x^2)+c$

100	The letter 'D' in D - Glucose signifies:-
Alt1	that it is a monosaccharide
Alt2	configuration at a particular chiral Carbon
Alt3	configuration at all chiral Cs
Alt4	dextrorotatory