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

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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

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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:-

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