2016

Question 1.
Two students, Chinedu and ..... were appointed to represent the class
( ) me
(+) I
( ) him
( ) her

Question 2.
The lecture hall is ....
( ) our's
( ) ours'
( ) us
(+) ours

Question 3.
This is mine and that is.....
(Type: Multiple Choice, Points: 1, Attempts: 1)
( ) their's
(+) yours
( ) your's
( ) yours'

Question 4.
Pick the correct option
( ) new beautiful rectangular Japanese car
( ) a blue new beautiful rectangular Japanese small car
(+) a beautiful small rectangular new blue Japanese car
( ) a Japanese blue new small beautiful car

Question 5.
Pick the correct option
( ) a fat old ugly black American lady
( ) an old black ugly fat American lady
( ) a black old fat ugly American lady
(+) an ugly fat old black American lady

Question 6.
Pick the correct option
(+) an expensive large champaign-coloured Mercedes benz car
( ) a large campaign-coloured expensive Mercedes benz car
( ) an expensive champaign-coloured large Mercedes benz car
( ) none of the above

Question 7.
Pick the correct option
( ) a large triangular expensive white Nigerian car
(+) the expensive large triangular white Nigerian bag
( ) the triangular white large expensive Nigerian bag
( ) all of the above

Question 8.
Peter and Paul fought... ..yesterday
(+) each other
( ) themselves
( ) one another
( ) themselves

Question 9.
I saw him .... the class
( ) sweep
( ) sweeps
( ) swept
(+) sweeping

Question 10.
Pick the correct option from the following:
(+) Mary as well as Ifeoma is at home
( ) Mary as well as Ifeoma were at home
( ) Mary as well as Ifeoma are at home
( ) all of the above

Question 11.
Pick the correct option from the following:
( ) The registrar and secretary of the Tenders board has resigned
( ) The registrar and secretary to the Tenders board has resigned
(+) The registrar and secretary to the Tenders board have resigned
( ) none of the above

Question 12.
Pick the correct option from the following:
( ) Each staff and each student are here
( ) Each staff and each student were here
(+) Each staff and each student is here
( ) none of the above

Question 13.
Pick the correct option from the following:
(+) You or I is responsible for the error
( ) You or I are responsible for the error
( ) You or I were responsible for the error
( ) You or I am responsible for the error

Question 14.

He.....down under the mango tree

( ) lay
( ) led
(+) laid
( ) layed

Question 15.

I would have been appointed to a senior position if

( ) I do not fail
( ) I did not failed
(+) I had not failed
( ) I do not failed

Question 16.

Sorry, I can't give any orange to you as I have..... left

( ) few
(+) a few
( ) fews
( ) Little

Question 17.

Choose the letter of the option that means the same as the underlined.

Smiling broadly, she explained why she always took exception to being referred to as his wife.

( ) objected to
(+) preferred very much
( ) felt specially honoured by
( ) liked nothing except
( ) exempted herself from

Question 18.

Choose the letter of the option that means the same as the underlined.

In those days, an ordinary school drop-out would come around putting on airs

( ) trying to impress the people
(+) trying to oppress the people
( ) wearing flashy clothes
( ) dressed in light material
( ) misbehaving

Question 19.

Choose the letter of the option that means the same as the underlined.

Ndidi decided to make a clean breast of everything. This means Ndidi

( ) said that her breast was clean
( ) remained firm in her earlier assertion
( ) denied any knowledge of the matter
(+) told the whole truth
( ) adopted clean habits in everything

Question 20.

Choose the letter of the option that means the same as the underlined.

The debating team was warned to make convincing point and not to play to the gallery. This means the team should not

( ) be selfish
( ) underrate the opponents
( ) be over-confident
(+) attempt to win cheap popularity
( ) Play unnecessary tricks

Question 21.

Choose the letter of the option that means the same as the underlined.

You cannot browbeat me into accepting what i didn't do. This means that the speaker will not be

(+) bullied
( ) defeated
( ) beaten
( ) humiliated
( ) suppressed

Question 22.

Choose the options that has the same vowel sound as the one represented by the letters underlined

Come

(+) Sun
( ) boy
( ) zero
( ) pot

Question 23.

Choose the options that has the same vowel sound as the one represented by the letters underlined

elite

(+) leave
( ) Tie
( ) Pen
( ) Red

Question 24.

Choose the options that has the same vowel sound as the one represented by the letters underlined

word

( ) form
(+) girl
( ) ward
( ) lord

Question 25.

Choose the options that has the same vowel sound as the one represented by the letters underlined

People

( ) poetry
(+) he
( ) pole
( ) abode

Question 26.

Choose the options that has the same vowel sound as the one represented by the letters underlined

Pot

( ) cut
( ) hold
(+) want
( ) down

Question 27.

Choose the options that has the same vowel sound as the one represented by the letters underlined

Sure

( ) dull
(+) tour
( ) push
( ) oral

Question 28.

Choose the options that has the same vowel sound as the one represented by the letter(s) underlined

hair

(+) mayor
( ) wait
( ) push
( ) oral

Question 29.

Choose the options that has the same vowel sound as the one represented by the letter(s) underlined

car

(+) far
( ) cat
( ) jam
( ) call
( ) care

Question 30.

Choose the letter of the option that means the same as the underlined.

The waters of the Niger meander through the Delta creeks into the Atlantic

( ) Enormous volume of water
( ) Many waters
( ) Many rivers
(+) Many distributaries

Question 31.

Choose the letter of the option that means the same as the underlined.

"We have many brandies in stock now!" declares the wholesale dealer

( ) Many bottle of brandy
( ) Many tots of brandy
( ) Large quantity of brandy
(+) Different brands of brandy

Question 32.

Choose the letter of the option that means the same as the underlined.

Here is a Daniel indeed

( ) A particular person called Daniel
( ) A man well known as Daniel
( ) Daniel of the Old Testament
(+) A person who behaves like Daniel in the Old testament

Question 33.

Choose the letter of the option that means the same as the underlined.

I am surprised to learn that Biebele is an agnostic

( ) someone that believes in God
( ) someone who antagonizes God
(+) someone who is nonchalant about the existence of God
( ) someone who does not believe in the existence of God

Question 34.

Choose the letter of the option that means the same as the underlined

The Doctor insisted on giving all of us prophylactic drugs.

( ) curative
(+) preventive
( ) routine
( ) special

Question 35.

When we got to the vice-chancellor's house, we were told that he ---------- two days earlier.

( ) may have left
( ) left
(+) had left
( ) has left

Question 36.

The university has a large collection of sporting ----

(+) equipment
( ) equipments
( ) costumes
( ) aids

Question 37.

After listening to the statements from the two students, the principal realized that it was a trivial
argument that ---------- a serious quarrel between them.

( ) touched in
( ) drew in
( ) sparked up
(+) brought up

Question 38.

Choose the most appropriate option opposite in meaning to the word(s) in italics.
The college was worried about Tamunosiki's *garrulous* tendencies.

(+) reticent
( ) loquacious
( ) quarrelsome
( ) outspoken

Question 39.

Choose the most appropriate option opposite in meaning to the word(s) in italics.
Their high level of dishonesty has made that department <u>infamous</u> in the entire secretariat.

(+) reputable
( ) notorious
( ) unpopular
( ) acceptable

Question 40.

Choose the most appropriate option opposite in meaning to the word(s) in italics.

Surveying the sky in the quiet of the night gives me an <u>ethereal</u> feeling.

( ) human
( ) mundane
( ) ordinary
(+) earthly

Question 41.

Choose the most appropriate option opposite in meaning to the word(s) in italics.
Ibechi's reaction to the issue was <u>malevolent</u>

(+) Kindly
( ) Vacuous
( ) Ambivalent
( ) Volatile

Question 42.

Which of the following words contains the sound /I/?

( ) loved
(+) liked
( ) whispered
( ) wondered

Question 43.

Choose the option that has the same vowel sound as the one represented by the letter(s) underlined
Bl<u>oo</u>d

( ) moved
( ) blurred
(+) son
( ) plot

Question 44.

Choose the option that has the same vowel sound as the one represented by the letter(s) underlined
Obt<u>ai</u>n

( ) odd
(+) away
( ) ore
( ) am

Question 45.

Choose the option that has the same vowel sound as the one represented by the letter(s) underlined
P<u>oo</u>r

( ) tear
( ) bore

( ) floor
(+) sure

Question 46.

Choose the option that has the same vowel sound as the one represented by the letter(s) underlined

Put

( ) hut
(+) book
( ) Crude
( ) room

Question 47.

choose the option that has the appropriate stress. The stressed syllables are written in capital letters.

Mathematics

( ) MA-the-ma-tics
( ) ma- THE-ma-tics
(+) ma-the-MA-tics
( ) ma-the-ma-TICS

Question 48.

choose the option that has the appropriate stress. The stressed syllables are written in capital letters.

Examination

( ) e-xa-MI-na-tion
( ) E-xa-mi-na-tion
(+) e-xa-mi-NA-tion
( ) e-xa-mi-na-TION

Question 49.

choose the option that has the appropriate stress. The stressed syllables are written in capital letters.

Affordability

(+) a-ffor-da-BI-lity
( ) A-ffor-da-bility
( ) a-FFOR-da-bi-lily
( ) a-ffor-DA-bi-lity

Question 50.

Choose the option that best conveys the meaning of the underlined words.

Can you put up with that girl's attitude to issues

(+) Tolerate
( ) exterminate
( ) disallow
( ) control
( ) deal with

Question 51.

Choose the option that most suitably fills the space

For three hours every day, she.....food in that restaurant.

( ) is busied to serve
(+) is busy serving
( ) keeps busy to serve
( ) kept busy to serve
( ) Serve

Question 52.

Choose the option that most suitably fills the space

This work of art has been handed.....from my fore fathers.

( ) In
( ) Over
(+) Down
( ) Up
( ) Across

Question 53.

Choose the option that most suitably fills the space

The couple first met.....the Nnamdi Azikiwe University convocation dinner.

( ) In
(+) At
( ) In course of
( ) On
( ) Inside

Question 54.

Choose the option that most suitably fills the space

Ngozi's gifts have been delivered. What about

( ) Uche
( ) Uche's own
( ) Uches
( ) Uches'
(+) Uche's

Question 55.

Choose the option that most suitably fills the space

The days are gone when ladies..... Dress elegantly.

(+) Would
( ) Will
( ) Should
( ) Could
( ) Used to

Question 56.

Choose the option that most suitably fills the space

Everyone would.....wish missed the show

( ) to not have
(+) not to have
( ) having not to
( ) to have not
( ) to having not

Question 57.

Choose the option that most suitably fills the space

Mr.Ahmadu has many cattle and all .....

( ) is tick-free
(+) are tick-free
( ) is ticks-free
( ) are ticks-free
( ) were ticks-free

Question 58.

Choose the option that most suitably fills the space

The students rounded their party late.

( ) up
( ) of
(+) off
( ) out
( ) In

Question 59.

Choose the option that most suitably fills the space

Her evidence led.....the nailing of the suspect

( ) at
( ) into
( ) in
(+) to
( ) on

Question 60.

Choose the option that most suitably fills the space

They went for the competition in very.....

( ) high spirit
(+) high spirits
( ) good spirit
( ) good spirits
( ) bogus spirit

Question 61.

Choose the option that is opposite in meaning to the underlined word

His Health has <u>deteriorated</u> in the past few weeks

( ) Collapsed
( ) Worsened
(+) Improved
( ) relaxed
( ) revived

Question 62.

Solve the equation

$$\sqrt{x+6}-\sqrt{x+3}=\sqrt{2x+5}$$

( ) -7
( ) -2
(+) -1
( ) No solution

Solution

$\sqrt{x+6}-\sqrt{x+3}=\sqrt{2x+5}....Square_both_sides$

$(x+6)-(x+3)=2x+5$

$collecting_termes$

$6-3-5=2x-x+x$

$-2=2x$

$x=\frac{-2}{2}=-1$

Question 63.

Solve the equation

$$3^{2x}-3^{x+1}+2=0$$

(+) x=0 or 2/log3
( ) x=0 or 2
( ) x=2 or 1
( ) No solution

Solution

$3^{2x}-3^{x+1}+2=0..can_be_rewritten_as$

$3^{2x}-3^{x}.3^{1}+2=0$

$(let_p=3^{x}):$

$p^{2}-3p+2=0...quadraticdly_we_have$

$(p-1)(p-2)=0$

$\therefore 3^{x}=1=3^{0}\Rightarrow x=1..also..3^{x}=2\Rightarrow x=\frac{2}{\log 3}$

Question 64.

In a recent survey of 400 students in some schools in Imo state, 100 were listed as smokers and 150 as chewers of gum, 75 were listed as both smokers and gum chewers. Find out how many students were neither smokers nor gum chewers?

( ) 75
( ) 150
( ) 100
( ) 225
(+) no solution

Solution

No solution

$A = \{11,13,17,19,23,29\}$

$B = \{11,13,15,17,19,21,23,25,27,29\}$

$C = \{10,12,14,15,16,18,20,21,22,24,25,26,27,28,30\}$

$B \cap C = \{15,21,24,25,27\} and$

$n(B \cap C) = 5$

$Hence_the_power_set = 2^n = 2^5 = 32$

Question 65.

If x-1 and x-2 are factor of

$$x^3 + ax^2 - 7x + b$$

were a and b are constants Find a and b

( ) -1, 2
(+) 0, 6
( ) 0, -6
( ) -6, 6

Solution

$Given_that_x - 1 = 0 \Rightarrow x = 1$

$f(1) = 1^3 + a(1)^2 - 7(1) + b = 0 \Rightarrow a + b = 6 ...(i)$

$Also, x - 2 = 0 \Rightarrow x = 2$

$f(2) = 2^3 + a(2)^2 - 7(2) + b = 0 \Rightarrow 4a + b = 6 ...(ii)$

$solving(i)_and_(ii)_simultaneously_gives_a = 0$

$b = 6$

Question 66.

Determine the sum of the series

$$2 + \frac{2}{3} + \frac{2}{3^2} + \frac{2}{3^3} + ...$$

(+) 3
( ) 6
( ) 9
( ) 2

Solution

Study Geometric progression

$$S_n = \frac{a}{1-r} = \frac{2}{1-\frac{1}{3}} = 3$$

Question 67.

Find the sum of the first 30 terms of an AP if the first is 7 and the last is 18

(+) 375
( ) 275
( ) 475
( ) 575

Solution

Study Arithmetic Progression

$Sum_of_AP = \frac{n}{2}(a + l) = \frac{30}{2}(7 + 18)$

$a = 7$

$n = 30$

$l = 18$

$\therefore S_n = 375$

Question 68.

The power of a set is 1024, how many elements are in this set?

(+) 10
( ) 8
( ) 12
( ) 6

Solution

Study set theorem

$Power_of_set = 2^n$

$n = number_of_elements_in_the_set$

$2^n = 1024 = 2^{10} \Rightarrow n = 10$

Question 69.

if

$3^{x^2} = 9^{x+4}$ the values of x are

( ) 2 and 4
( ) -2 and -4
(+) -2 and 4
( ) 3 and 5

Solution

$$3x^2 = 9^{x+4} \Rightarrow 3^{x^2} = 3^{2(x+4)}$$
$$x^2 = 2(x+4) \Rightarrow x^2 - 2x - 8 = 0$$
$$solving_quadraticdly$$
$$(x+2)(x+4) = 0$$
$$\therefore x = -2,4$$

Question 70.

Simplify

$$\frac{3(2^{n+1}) - 4(2^{n-1})}{2^{n+1} + 2^n}$$

( ) $\frac{2^{n+1}-2}{2^n}$

(+) 4

( ) 2^{n-1}

( ) $-\frac{1}{2^n}$

Solution

$$\frac{3(2^{n+1}) - 2^2(2^{n-1})}{2^{n+1} - 2^n} = \frac{2^{n+1}(3-1)}{2^n(2-1)}$$
$$\frac{2^{n+1}.2^1}{2^n} = 2^{n+2-n} = 2^2 = 4$$

Question 71.

If

$$\cos\theta = 5/13.then_\frac{\sin\theta}{\sin\theta + \cos\theta} is$$

( ) $\frac{12}{13}$

( ) $\frac{12}{15}$

(+) $\frac{12}{17}$

( ) $\frac{13}{17}$

Solution

$$\cos\theta = 5/13 = Adj / Hyp$$
$$from_pythagords_theorem$$
$$x = 13^2 - 5^2 = 12$$
$$\sin\theta = 12/13 = opp / hyp$$
$$\frac{\sin\theta}{\sin\theta + \cos\theta} = \frac{\frac{12}{13}}{\frac{12}{13} + \frac{5}{13}} = \frac{\frac{12}{13}}{\frac{17}{13}} = \frac{12}{13} \times \frac{13}{17} = \frac{12}{17}$$

Question 72.

Solve the expression

$2\sin^2\theta + \cos^2\theta$ if cos=5/13

( ) $\frac{213}{169}$

( ) $\frac{194}{169}$

( ) $\frac{413}{169}$

(+) $\frac{313}{169}$

Solution

$$2\sin^2\theta + \cos^2\theta$$
$$= 2\left(\frac{12}{13}\right)^2 + \left(\frac{5}{13}\right)^2 = 2\left(\frac{144}{169}\right) + \frac{25}{169}$$
$$= \frac{288}{169} + \frac{25}{169} = \frac{313}{169}$$

Question 73.

A four member committee is elected from 7 candidates including two brothers. How many committees can be elected including the two brothers?

( ) 0

(+) 10

( ) 15

( ) 25

Solution

$$^5C_3$$
$$\text{Re}call: \frac{n!}{(n-r)!.r!}$$
$$\therefore \frac{5!}{(5-3)!3!} = \frac{5 \times 4 \times 3!}{2 \times 3!} = 10$$

Question 74.

What is the remainder

218^3 when is divided by 8?

(+) 0
( ) 1
( ) 2
( ) 3

Solution

$218^3 = 10360232$

$\frac{10360232}{8} = 1295029_remainder_0$

Question 75.

What is 40th element of the series: 11, 17, 23.....?

( ) 240
( ) 244
(+) 245
( ) 248

Solution

$T_n = a + (n-1)d$

$Given_that_a = 11, d = 6, n = 40$

$\therefore T_{40} = 11 + (40-1)6 = 11 + 39 \times 6 = 245$

Question 76.

Given {the universal set E = {1,2,3,4,5,6} and the sets p={1,2;3,4}, Q = {3,4,5} and R = {2 4.6}. Find P U (Q U R)

( ) {4}
( ) {1,2,3,4,}
( ) {1,2,3 5.6}
(+) {1,2,3,4,5,6}

Solution

Study Set theorem

E = {1,2,3,4,5,6}

p={1,2,3,4},

Q = {3,4,5} and

R = {2 4.6}. hence P U (Q U R) ={1,2,3,4,5,6}

Question 77.

A box contains four balls: two red and two yellow balls. We extract two balls. What is the probability of extracting two red balls?

( ) 1/16
( ) 1/12
(+) 1/6
( ) ¼

Solution

Study probability

$$\Pr(1^{st}_draw_of_red) = \frac{2}{4}$$

$$\Pr(2^{nd}_draw_of_red) = \frac{1}{3}$$

$$\therefore \Pr(bot_reds) = \frac{2}{4} \times \frac{1}{3} = \frac{1}{6}$$

Question 78.

If m and n are whole number and

$m^n = 196_find_(m-3)^{(n+1)}$

( ) 2744
( ) 1
( ) 121
(+) 1331

Solution

$m^n = 196$

$we_know_that_14^2 = 196$

$Hence_we_can_take_m = 14_and_n = 2$

$(m-3)^{(n+1)} = (14-3)^{(2+1)} = 11^3 = 1331$

Question 79.

Simplify

$$\frac{4}{2+\sqrt{5}}$$

( ) $5\sqrt{3} - 8$
( ) $8 - 4\sqrt{5}$
(+) $4\sqrt{5} - 8$
( ) $8 - 4\sqrt{3}$

Solution

Study Surd

$$\frac{4}{2+\sqrt{5}} = \frac{4(2-\sqrt{5})}{2+\sqrt{5}(2-\sqrt{5})} = \frac{8-4\sqrt{5}}{4-5} = \frac{8-4\sqrt{5}}{-1}$$

$8(-4\sqrt{5}) = 4\sqrt{5} - 8$

Question 80.

Find the remainder

$x^4 - 3x^3 + 4x^2 - 6x + 7_divided_by_x - 1$

( ) 0
(+) 3

( ) 2
( ) 7

Solution

$x^4 - 3x^3 + 4x^2 - 6x + 7._divided_by_x - 1$

$i.e_x = 1$

$substitute_1_where_x_is_found$

$f(1): 1^4 - 3(1)^3 + 4(1)^2 - 6(1) + 7$

$\Rightarrow 1 - 3 + 4 - 6 + 7 = 3$

Question 81.

The 6th term of a Geometric Progression (GP) is 2000. Find the first term if its common ratio is 5

( ) 16/20
( ) 25/16
( ) 20/16
(+) 16/25

Solution

Study Geometric Progression

$U_6 = ar^5 = 2000,$

$r = 5$

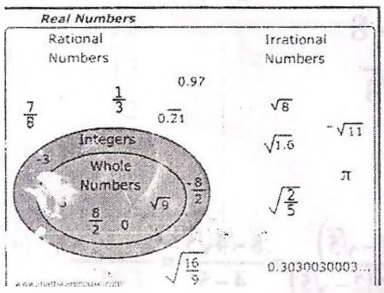
$a(5)^5 = 2000 \Rightarrow 3125a = 2000 \Rightarrow a = 16/25$

Question 82.

Which of the following numbers is irrational

( ) $\sqrt{49}$
( ) $1/2$
( ) 3
(+) $\frac{1}{3}$

Solution



Question 83.

Find s and t if (x-2) and (x+ 1) are factors of

$sx^3 + 3x^2 - 9x + t$

( ) -2, 10
(+) 2, -10
( ) -2, -10
( ) 2, 10

Solution

$sx^3 + 3x^2 - 9x + t$

$f(2) = 8s + 12 - 18 + t = 0$

$\Rightarrow 8s + t = 6....(1)$

$f(-1) = -s + 3 + 9 + t$

$\Rightarrow -s + t = -12...(2)$

$solve_(1)_and_(2)_simultaneously_to_get_s = 2_and_t = -10$

Question 84.

if $\log_x 10.24 = 2$ find x

( ) 32
( ) 0.32
( ) 320
(+) 3.2

Solution

Study logarithm

$\log_x 10.24 = 2 \Rightarrow x^2 = 10.24$

$x^2 = \frac{1024}{100} = \left(\frac{32}{10}\right)^2$

$x = \frac{32}{10} = 3.2$

Question 85.

The sum of an AP is 20, the first term being 8 and the common difference -2. Find the number of terms, n in the series

( ) 3 or 7
( ) 2 or 3
(+) 4 or 5
( ) 1 or 6

$S_n = \frac{1}{2} n[2a + (n-1)d]$

$20 = \frac{1}{2} n(16 + (n-1) - 2)$

$40 = n(16 + 2 - 2n) \Rightarrow 40 = 18n - 2n^2$

$2n^2 - 18n + 40 \Rightarrow n = 4\ or\ 5$

Question 86.

Find x if |x+3|=2

( ) 1, 5
(+) -1, 5
( ) -1, -5
( ) -1, 3

Solution

$$|x+3| = 2 \Rightarrow x+3 = 2 \Rightarrow x = -1$$

$$Also - (x+3) = 2 \Rightarrow x = 5$$

Question 87.

If the number 481 *673 is completely divisible by 9, what is the smallest whole number in place of *?

( ) 3
(+) 7
( ) 5
( ) 9

Solution

Let x be the smallest whole number in place of *
Given that 481 *673 to be completely divisible by 9.
=> (4 + 8 + 1+ x + 6 + 7 + 3) is divisible by 9
=> (29 + x) is divisible by 9
x should be the smallest whole number. Hence. (29 + x) =36
=> x = 36 - 29 = 7

Question 88.

If N25,000.00 is kept in a bank at the rate of 2% simple interest, how much will it amount to at the end of 5 years?

( ) N2,500.00
( ) N5,000.00
( ) N12,500.00
(+) N27,500.00

Solution

Recall

$$P = \frac{IRT}{100} = \frac{25000 \times 2 \times 5}{100} = 2500$$

$$Amount = P + I = 25000 + 2500 = N27500$$

Question 89.

Construct a quadratic equation whose roots are -3/2 and 7

( ) $3x^2 + 11x + 21 = 0$
( ) $2x^2 + 11x + 21 = 0$
(+) $2x^2 - 11x - 21 = 0$
( ) $3x^2 - 11x - 21 = 0$

Solution

$$Given_that_x = \frac{3}{2}$$

$$and_x = 7:$$

$$2x = -3 \quad and_x - 7 = 0$$

$$(2x+3)(x-7) = 2x^2 - 11x - 21 = 0$$

Question 90.

in proving the congruence of two triangles, which of the following is not important?

( ) two sides and the included angles
(+) two angles and a side
( ) three sides
( ) three angles

Solution

The answer is "two angles and a side "

Question 91.

A chord XY of a circle with centre a and radius 5.32cm has <XOY = 140°. What is the length of the chord to the nearest centimetre?

(+) 10cm
( ) 6cm
( ) 5cm
( ) 3cm

Solution

$$Length_of_chord = 2r\sin\frac{\theta}{2}$$

$$Length = 2 \times 5.32 \times \sin\frac{140}{2} = 10cm$$

Question 92.

If Sin(x+30) = Cos 40, find x.

( ) 10
(+) 20
( ) 59
( ) 65

Solution

$$Sin(x+30)^0 = cos40$$

$$cos(x+30)^0 = cos(90-40)^0$$

$$x + 30 = 50 \Rightarrow x = 20$$

Question 93.

Deim[illegible] bought som[illegible] packets of [illegible]ts for N[illegible] f the [illegible]ts [illegible] a packet che p[illegible] ld have received [illegible] more packets for h[illegible] How many packet did he buy?

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( ) 12
(+) 8
( ) 6
( ) 10

Solution

Let the number of packets Deinma bought be x and the price per packet be y. From the problem statement, xy = 120 and (x+2)(y-3) = 120; Combining the two equations, the following quadratic equation emerges:

$$x^2 + 2x - 80 = 0$$

Solving, x = - 10 or 8. The number of packets cannot be negative and x = -10 is discarded.

Question 94.

Solve for x if

$$25^x + 3(5^x) = 4$$

( ) 1 or -4
(+) 0
( ) 1
( ) -4 or 0

Solution

$Given_25^x + 3(5^x) = 4$

$Let_p = 5^x$

$p^2 + 3p = 4 \Rightarrow p^2 + 3p - 4 = 0(solve_quadraticdly)$

$p = 1, -4$

$But_p = 5^x, at_p = 1$

$1 = 5^x \Rightarrow 5^0 = 5^x$

$hence_x = 0$

Question 95.

What is the value of x if

$$\left(\frac{a}{b}\right)^{x-4} - \left(\frac{b}{a}\right)^{x-8}$$

( ) 4
(+) 6
( ) 7
( ) 10

Solution

$$a^n = \frac{1}{a^{-n}}$$

$$\left(\frac{a}{b}\right)^{x-4} = \left(\frac{b}{a}\right)^{x-8} \Rightarrow\Rightarrow \left(\frac{a}{b}\right)^{x-4} = \left(\frac{a}{b}\right)^{-(x-8)}$$

$$\Rightarrow x - 4 = -(x-8) \Rightarrow\Rightarrow x - 4 = -x + 8$$

$$\Rightarrow 2x = 12 \Rightarrow\Rightarrow x = \frac{12}{2} = 6$$

Question 96.

If 75 percent of all Nigerians own an automobile 15 percent of All Nigerians own bicycles and 20 percent of all Nigerians own neither an automobile nor a bicycle, what percent of Nigerians own both an automobile and a bicycle?

( ) 0%
( ) 1.33%
( ) 3.75%
(+) 10%

Solution

75% own automobiles. 15% own bicycles and 20% own neither an automobile nor bicycle. Summation of the percentages is 110. The total ought to be 100% if there were no duplications, that is, some people owning automobiles and bicycles as well. These people represent the additional 10% because they were counted twice.

Question 97.

Sam and Jessica are invited to a dance. If there are 7 men and 7 women in total at the dance, and one woman and one man are chosen to lead the dance what is the probability that Sam and Jessica will NOT be chosen to lead the dance?

( ) 1/49
( ) 1/7
( ) 6/7
(+) 48/49

Solution

Study Probability

The probability of Sam and Jessica being chosen to lead the dance is (1/7)(1/7) = 1/49. The probability of both of them not chosen is 1- (1/49) = 48/49.

Question 98.

A bag contains a number of balls of which 58 are red, 78 are green, and the rest are blue. If the probability of choosing a blue ball from this bag at random is 0.20, how many blue balls are in the bag?

(+) 34
( ) 56
( ) 78
( ) 102

Solution

Let number of blue balls be x. Total number of balls=58+78+x. Since probability of picking a blue ball is

$$\frac{x}{136 + x} = 0.20$$

$$0.20(136 + x) = x$$

$$27.2 + 0.2x = x$$

$Collecting_like_terms$

$$27.2 = x - 0.2x$$

$$27.2 = 0.8x$$

$$x = \frac{27.2}{0.8} = 34$$

Question 99.

The graph of cumulative frequency distribution is known as

(+) an ogive
( ) a histogram
( ) a frequency polygon
( ) relative frequency

Solution

The answer is "an ogive"

Question 100.

The volume of a cone of height 9cm is 1848 cm3 Find its radius (Take pie = 22/7).

( ) 7cm
(+) 14cm
( ) 28cm
( ) 98cm

Solution

The volume of a cone is given by

$$V = \frac{1}{3}\pi r^2 h = 1848$$

$$Substituting, \frac{1}{3}\left(\frac{22}{7}\right)(r^2)(9) = 1848$$

$$\frac{22}{21}(r^2)(9) = 1848$$

$$9.43r^2 = 1848$$

$$r^2 = \frac{1848}{9.43} = 195.97$$

$$r = \sqrt{195.97} = 13.999 \cong 14cm$$

$$Solving_for_r_gives_r = 14cm$$

Question 101.

T varies inversely as the square root of F when T =7

F=2 1/4, Find T when F = 2 7/9

( ) 1.5
(+) 6.3
( ) 7.3
( ) 12.6

Solution

$$Given_that_T = 7_and_F = 2\tfrac{1}{4}$$

$$T\alpha\frac{1}{\sqrt{F}} \Rightarrow T = \frac{K}{\sqrt{F}} \Rightarrow T = \frac{K}{\sqrt{\frac{9}{4}}}$$

$$\Rightarrow T = \frac{K}{\frac{3}{2}} \Rightarrow k = 7\times\frac{3}{2} = \frac{21}{2}$$

$$When_F = 2\tfrac{7}{9}, T = \frac{\frac{21}{2}}{\sqrt{\frac{25}{9}}} = \frac{\frac{21}{2}}{\frac{5}{3}} = \frac{21}{2}\times\frac{3}{5} = \frac{63}{10} = 6.3$$

Question 102.

Evaluate

$$\left(2^5\times4^{-2}\right)\div\left(2^{-3}\times2^6\right)$$

( ) 9
( ) 8.
( ) 8/9
(+) ¼

Solution

$$\left(2^5\times4^{-2}\right)\div\left(2^{-3}\times2^6\right)$$

$$\frac{32\times\frac{1}{16}}{\frac{1}{8}\times64} = \frac{2}{8} = \frac{1}{4}$$

Question 103.

Which of the following properties is/are common to parallelograms and rectangles? I. all angles are right angles II. the diagonals are equals. III. the opposite sides are equal and parallel.

( ) I and II
( ) I and III
( ) II and III
(+) III

Solution

The answer is "III" which is "the opposite sides are equal and parallel."

Question 104.

Which of the following angular inequalities defines an obtuse angle?

( ) $0^0 < x < 90^0$
( ) $0^0 \le x > 180^0$
(+) $90^0 < x < 180^0$
( ) $90 \le x < 180^0$

Solution

The answer is 90<x<180

Question 105.

The chances of Usman and Dele passing a Mathematics test are 1/2 and 1/3 respectively. What is the probability that neither of them passes the test?

( ) 3/5
( ) 2/5
( ) 4/15
(+) 1/3

Solution

$$\Pr(Usman_not_passing) = 1 - \frac{1}{2}$$

$$\Pr(Dele_not_passing)_1 - \tfrac{1}{3} = \tfrac{2}{3}$$

$$\Pr(neither) = \tfrac{1}{2} \times \tfrac{2}{3} = \tfrac{1}{3}$$

Question 106.

Find the mean deviation of 20,25,21,27,28, 29, to the nearest whole number

( ) 2
( ) 3
(+) 4
( ) 5

Solution

$$Mean = \frac{20+25+21+27+28+29}{6} = \frac{150}{6} = 25$$

$$Mean_deviation = \frac{|20-25|+|25-25|+|21-25|+|27-27|+|28-25|+|29-25|}{6} =$$

$$\frac{5+0+4+2+8+4}{6} = \frac{23}{6} = 3.83 \approx 4$$

Question 107.

Calculate the area of a parallelogram whose diagonals are of length 8cm and 12cm and intersect at an angle of 135°

( ) 271.5cm2
( ) 135.8cm2
( ) 96.0cm2
(+) 33.9cm2

Solution

$$A = \tfrac{1}{2} ab \sin\theta$$

$$A = \tfrac{1}{2} \times 8 \times 12 \times \sin 135 = 33.9cm^2$$

Question 108.

If tan a = 112 and tan b = 113 and both a and bare acute, find tan (a+ b).

( ) 0.015
(+) 1
( ) 10
( ) 39.81

Solution

$$\tan(a+b) = \frac{\tan a + \tan b}{1 - \tan a \tan b} = \frac{\frac{1}{2} + \frac{1}{3}}{1 - \left(\frac{1}{2} \times \frac{1}{3}\right)}$$

$$\frac{\frac{3+2}{6}}{1 - \frac{1}{6}} = \frac{\frac{5}{6}}{\frac{5}{6}} = \frac{5}{6} \times \frac{6}{5} = 1$$

Question 109.

The median of a distribution can be estimated from

( ) Barchart
(+) Cumulative frequency curve
( ) Frequency polygon
( ) Pictorial

Solution

The answer is "Cumulative frequency curve"

Question 110.

P and Q are fixed points and X is a variable point which moves so that angle PXQ = 45°. What is the locus of X?

( ) A pair of straight lines parallel to PQ
(+) The perpendicular bisector of PQ
( ) An arc of a circle passing through P and Q
( ) A circle with diameter PQ
( ) The bisector of angle PXQ

Solution

The answer is "The perpendicular bisector of PQ"

Question 111.

A sector of a circle is bounded by two radii 7cm long and an arc of length 6cm. find the area of the sector.

( ) 42cm2
( ) 3cm2
(+) 21 cm2
( ) 24cm2
( ) 12cm2

Solution

$$Area_of_sector = \frac{\theta}{360} \times \pi r^2$$

$$But_length_of_arc = \frac{\theta}{360} \times 2\pi r^2$$

$$6 = \frac{\theta}{360} \times 2 \times \frac{22}{7} \times 7$$

$$308\theta = 15120 \Rightarrow \theta = \frac{15120}{308} = 49^0$$

$$Area_of_a_Sector = \frac{49}{360} \times \frac{22}{7} \times 7^2$$

$$= 20.9cm^2 \cong 21cm^2$$

Question 1.

choose the option nearest in meaning to the underlined expression.

The story has to be taken with a grain of salt. This means that

( ) you need some salt to listen to the story
( ) there is no salt in the story
(+) The story is questionable
( ) The story is true
( ) you have too much salt in the story

Question 2.

choose the option nearest in meaning to the underlined expression.

It is usually hard to change the course of action when one crosses the Rubicon.

( ) pass through a place called Rubicon
( ) cross a river called Rubicon
( ) cross a bridge called Rubicon
( ) pass a special test
(+) be irrevocably committed

Question 3.

choose the option opposite in meaning to the word underlined

Emeka is naturally taciturn.

( ) friendly
( ) cheerful
( ) dumb
( ) lively
(+) garrulous

Question 4.

choose the option opposite in meaning to the word underlined

He is loved for his altruism.

( ) benevolence
( ) sincerity
(+) selfishness
( ) selflessness
( ) kindness

Question 5.

choose the option nearest in meaning to the word(s) or phrase(s) underlined

The gallant soldiers met their waterloo unexpectedly.

( ) victory
( ) trouble
(+) defeat
( ) happiest period
( ) enemy

Question 6.

choose the option nearest in meaning to the word(s) or phrase(s) underlined

It is futile trying to make bricks without straw.

( ) fertile
( ) important
( ) fragile
(+) vain
( ) bad

Question 7.

choose the expression or word which best completes each sentence

The student who went home without an exit has apologized..... his misconduct

( ) on
( ) at
( ) to
(+) for
( ) about

Question 8.

choose the expression or word which best completes each sentence

The man has atoned.....his sins.

( ) upon
( ) on
(+) for
( ) at
( ) against

Question 9.

Choose from the options the word that has the same vowel sound as the one represented by the letter(s) underlined

Rust

( ) loud
(+) touch
( ) bought
( ) marsh
( ) roast

Question 10.

Select the word that has the same pattern of stress as the given word

ENORMOUS

( ) interest
(+) solution
( ) stupidly
( ) character
( ) harmony

Question 11.

A ball is thrown vertically upwards from the ground with an initial velocity of 50m/s what is the total time spent by the ball in the air.

( ) 2.5s
(+) 5.0s
( ) 10.0s
( ) 15.0s
( ) 20.0s

Solution

From v = u + at; v = 0, u = 50m/s, g = 10m/s2
U = at; t = u/g = 50/10 = 5s
Refer to Page 16 New School PHYSICS by M.W. Anyakoha, Ph D (Forth Edition. 2015)

Question 12.

A body of mass 60g appears to have a mass of 39g when totally immersed in oil and appears to have a mass 36g when totally immersed in water. Calculate the relative density of oil.

( ) 8/7
( ) 13/12
( ) 12/13
(+) 7/8
( ) 13/20

Solution

$$\text{Relative density of oil} = \frac{60-39}{60-36} = \frac{21}{24} = \frac{7}{8}$$

Refer to Page 361 New School PHYSICS by M.W. Anyakoha, Ph D (Forth Edition. 2015)

Question 13.

Two resistors R1and R2 are connected in parallel, R2 being greater than R1. The combined resistance is

(+) less than R1
( ) greater than R2
( ) the sum of R1and R2
( ) the difference of R1and R2
( ) greater than R1 but less than R2

Solution

Parallel resistors

$$\frac{1}{Rsum} = \frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3}$$

Refer to Page 392 New School PHYSICS by M.W. Anyakoha, Ph D (Forth Edition. 2015)

Question 14.

Two capacitances of 6uf and 8uf are connected in series. What additional capacitance must be connected in series with this combination to give a total of 3uf?

( ) 3uf
( ) 16uf
(+) 24uf
( ) 30uf
( ) 14uf

Solution

Let the additional capacitance be x

For series connection: 1/c = 1/6 + 1/8 + 1/x = 1/3

$$\frac{4x+3x+24}{24x} = \frac{1}{3}$$

3(7x + 24) = 24x; 7x + 24 = 8x
8x - 7x = 24; ∴ x = 24microfarads

Refer to Page 385 New School PHYSICS by M.W. Anyakoha, Ph D (Forth Edition. 2015)

Question 15.

The upper and lower fixed points of a thermometer are 90 and 10 respectively. Determine the temperature on the Kelvin scale when the reading on T is 30°.

( ) 25K
(+) 298K
( ) 80K
( ) 303K
( ) 293K

Solution

$$\frac{90-10}{30-10}=\frac{373-273}{x-273}$$

$$\frac{80}{20}=\frac{100}{x-273}$$

$$4(x-273)=100$$

$$x-273=25$$

$$\therefore x=25+273=298k$$

Refer to Page 207 New School PHYSICS by M.W. Anyakoha, Ph D (Forth Edition. 2015)

Question 16.

If a copper has a heat capacity of 80J/C and specific heat capacity of 400J/kg. Calculate it's mass.

(+) 0.20kg
( ) 320kg
( ) 20.0kg
( ) 0.02kg
( ) 5kg

Solution

Equation relating specific heat capacity(C), heat capacity(H) and mass(M)

H=MC

M=H/C=80/400=0.20kg

Refer to Page 214 New School PHYSICS by M.W. Anyakoha, Ph D(Forth Edition. 2015)

Question 17.

An object of height 12.0cm is placed from a pinhole camera, if the image distance from the pinhole is 10.0cm, calculate the image height.

( ) 12.0cm
(+) 5.0cm
( ) 120.0cm
( ) 120.0m
( ) none of the above

Solution

Height of image = ?, Height of object = 12cm, Distance of image = 10cm, Distance of object = 24cm

$$Magnification=\frac{Height\,of\,Image}{Height\,of\,Object}=\frac{distance\,of\,Image}{Distance\,of\,object}=\frac{x}{12}=\frac{10}{24}$$

$$x=\frac{12\times10}{24}=5cm$$

Refer to Page 274 New School PHYSICS by M.W. Anyakoha, Ph D (Forth Edition. 2015)

Question 18.

Calculate the minimum value of the refractive index of a 45° prism which is used to turn a beam of light by total internal reflection through 90°

( ) 1
( ) 1.50
(+) 1.41
( ) 1.20
( ) 4.11

Solution

$$R.I={}_gn_a=\sin i/\sin r=\frac{\sin 45}{\sin 90}=0.7071$$

$$Also,{}_an_g=\frac{1}{{}_gn_a}=\frac{1}{0.7071}=1.41$$

Refer to Page 295 New School PHYSICS by M.W. Anyakoha, Ph D (Forth Edition. 2015)

Question 19.

A wave of frequency 75Hz form a stationary pattern in a medium where the distance between adjacent nodes is 2.0cm. What is the velocity of the wave?

(+) 3m/s
( ) 30m/s
( ) 300m/s
( ) 0.3m/s
( ) 150m/s

Solution

Distance between adjacent nodes =

$$\frac{\lambda}{2}=2cm$$

$$\lambda=2\times2cm=4.0cm=0.04m;$$

$$f=75Hz$$

$$velocity=f\lambda=75\times0.04=3m/s$$

Refer to Page 258, 262, and 263 New School PHYSICS by M.W. Anyakoha, Ph D(Forth Edition. 2015)

Question 20.

The half-life of a nuclide is 5days, what fraction of the initial sample will remain after 30 days.

( ) 1/8
( ) 1/16
( ) 1/24
( ) 1/36

(+) 1/64

Solution

For 30 days

$N/2 \rightarrow 5days$

$N/4 \rightarrow 5days$

$N/8 \rightarrow 5days$

$N/16 \rightarrow 5days$

$N/32 \rightarrow 5days$

$N/64 \rightarrow 5days$

Refer to Page 472 New School PHYSICS by M.W. Anyakoha, Ph D (Forth Edition. 2015)

Question 21.

How many farad's of electricity are required to deposit 216grams of silver from a solution of silver nitrate?

( ) 1

(+) 2

( ) 3

( ) 4

( ) 5

Solution

Mole of Silver deposited=Mass deposited/molar mass=216/107.47=2mole

$Ag^{+}_{(aq)} + e \rightarrow Ag_{(s)}$

From the above equation, 1 mole of Ag produces 1 F

∴ 2 mole of Ag will produce X 1F (cross multiplying)

XF x 1 = 2 x 1F; X = 2Faraday

Refer to Page 204 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition. 2013)

Question 22.

Which is the most acidic oxide of the following?

( ) CO

( ) MnO

( ) CaO

(+) N2O

( ) Cr2O3

Solution

The answer is N2O

Refer to Page 373 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition. 2013)

Question 23.

The carbon atoms in propyne are arranged at

( ) 60°

( ) 90°

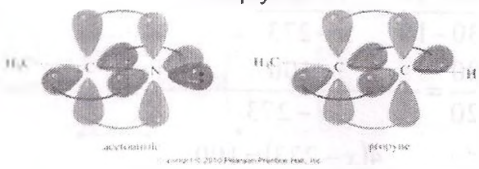
( ) 109°

( ) 120°

(+) 180°

Solution

Structures of Acetonitrile and Propyne



In both compounds, the atoms at the ends of the triple bonds are *sp* hybridized, and the bond angles are 180°.
In place of the acetylenic hydrogen atom, the nitrile has a lone pair of electrons in the *sp* orbital of nitrogen.

Question 24.

Which of the following have saturated isomer?

( ) methane and ethane

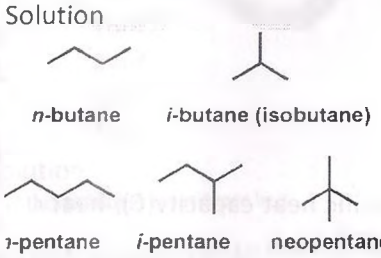
( ) methane and propane

( ) ethane and propane

( ) butane and methane

(+) butane and pentane

Solution



As you can see the isomers are all saturated because they have neither double nor triple bond.

Question 25.

When coal is heated at 1000 - 1300c, the product is

(+) coal gas

( ) coal liquid

( ) coal peat

( ) coal flash

( ) coal bed

Solution

The answer is "coal gas "

Refer to Page 126 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition. 2013)

Question 26.

Which one of the following is a brittle material?

( ) rubber

( ) plastic

( ) thermoplastic

(+) glass

( ) gum

Solution

The answer is "glass "

Question 27.

Which of these mathematical relationship is for Charles law?

( ) V = k(1/p)

( ) V = KT/p

(+) V = KT

( ) V = 1/p

( ) V = P/T

Solution

V=KT

Refer to Page 81 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition. 2013)

Question 28.

Kinetic theory of gases have.....postulates

( ) 1

( ) 2

( ) 3

( ) 4

(+) 5

Solution

The answer is "5" which are;

Charles Law, Boyle's Law, Gay Lussacs Law, Avogadros Law and Daltons Law

Refer to Page 78-88 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition. 2013)

Question 29.

Which of the following have a covalent bond.

( ) silver

( ) copper

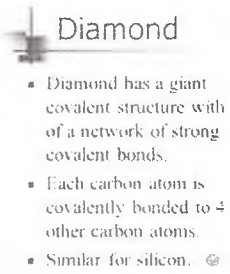
( ) sodium

( ) zinc

(+) diamond

Solution

The answer is Diamond



Question 30.

Which of the following animals lack alimentary canal.

( ) earthworm

(+) Jelly fish

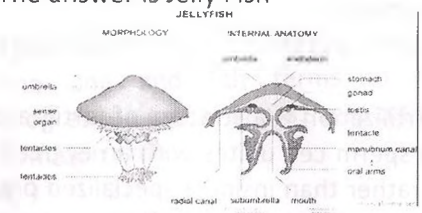
( ) insect

( ) fish

( ) mollusk

Solution

The answer is Jelly Fish



Question 31.

..... is not a major air pollutant.

( ) carbon monoxide

( ) ozone

(+) oxygen

( ) sulphur dioxide

( ) hydrogen sulphide

Solution

Energy is life and the production of energy in the body depends upon oxygen. The second important function of oxygen is to combine with metabolic waste products to allow their elimination from the body. This process is called the oxidation reduction cycle.

Question 32.

Which of the following is not a function of a tongue.

( ) function as organ of taste

( ) helps in softening food

(+) it helps during chewing of food

( ) it helps in swallowing of food

( ) it is essential in speech

Solution

It helps during chewing of food

Refer to Page 292 Modern Biology by Sarajini T. Ramalingam, BSc(Hons.), PhD (Sixth Edition. 2013)

Question 33.

The most direct product of meiosis in a plant is

(+) spore

( ) gamete

( ) zygote
( ) sporophyte
( ) gametophyte

Solution

The answer is "Spore"

Question 34.

Which of the following vertebrate undergo external fertilization?

(+) amphibian
( ) reptiles
( ) birds
( ) mammals
( ) both C and D

Solution

External fertilization is a strategy of fertilization in which a sperm cell unites with an egg cell in the open, rather than inside a specialized organ within the body of a parent. Releasing eggs and sperm into water is called spawning.

Question 35.

Human somatic cells are made up of X and Y chromosome. However chromosome is found in.

( ) zygote
( ) ovum
(+) sperm cell
( ) cell of a female
( ) egg cells

Solution

Chromosome is found in Sperm cell

Refer to Page 553 Modern Biology by Sarajini T. Ramalingam, BSc(Hons.), PhD (Sixth Edition. 2013)

Question 36.

Open circulatory system is found in

( ) rat
( ) bird
( ) toad
(+) insect
( ) fish

Solution

Insects has an Open circulatory System

Question 37.

Which bone is called the bone of the digits?

( ) humerus
( ) femur
( ) sacrum
(+) phalanges
( ) tibia

Solution

Phalanges is also called the bone of the Digits

Question 38.

Which of the following is essential for a living cell?

( ) flagella
( ) capsule
( ) cell wall
(+) cytoplasm membrane
( ) capsule and cell wall

Solution

The cell or plasma membrane is selectively permeable to ions and organic molecules and controls the movement of substances in and out of cells. The basic function of the cell membrane is to protect the cell from its surroundings. It consists of the phospholipid bilayer with embedded proteins.

Question 39.

Bacteria flagella impart mobility to the cell by

(+) undulating movement
( ) rotator movement
( ) gliding movement
( ) swaying movement
( ) looping movement

Solution

The answer is "Undulating Movement"

Question 40.

Simplify the expression

$$\left(\frac{16}{81}\right)^{-3/4}$$

( ) 8/17
( ) 27/4
(+) 27/8
( ) 2/3
( ) 9/4

Solution

$$\left(\frac{16}{81}\right)^{-3/4} = \frac{1}{8/27} = \frac{27}{8}$$

Question 41.

Find x^2-y^2

$$X = \frac{a^n + a^{-n}}{2}$$

$$Y = \frac{a^n \quad a^{-n}}{2}$$

( ) 5
( ) 4
(+) 1
( ) 3
( ) 2

Solution

$$(x-y)(x+y) = \frac{(a^n+a^{-n}}{2} - \frac{a^n-a^{-n})}{2}\frac{(a^n+a^{-n}}{2} + \frac{(a^n-a^{-n})}{2}$$

$$\frac{(2a^{-n})}{2}\frac{(2a^n)}{2} = a^{-n+n} = a^0 = 1$$

Question 42.

What's the remainder when

$4x^3 - 5x + 2$ is divided by (x-1)

(+) 1
( ) 2
( ) 3
( ) -1
( ) -2

Solution

X-1=0 $\quad 4x^3 - 5x + 2$

Therefore X=1

Subsitute x value into the quadratic equation

$$F(1) = 4(1)^3 - 5(1) + 2 = 4 - 5 + 2 = 1$$

Study Polynomial Equation

Question 43.

If a = 2 + $\sqrt{3}$ find the value of a - 1/a

( ) $\sqrt{3}$

(+) $2\sqrt{3}$

( ) $\sqrt{2}$

( ) $3\sqrt{5}$

Solution

$$2+\sqrt{3} - \frac{1}{2+\sqrt{3}} = \frac{(2+\sqrt{3})(2+\sqrt{3})-1}{2+\sqrt{3}} \times \frac{2-\sqrt{3}}{2-\sqrt{3}} = \frac{(6+4\sqrt{3})(2-\sqrt{3})}{1}$$

$$= 12 - 6\sqrt{3} + 8\sqrt{3} = 2\sqrt{3}$$

Question 44.

The 2nd and 5th terms of a geometric progression are 24 and 81 respectively. Find the common ratio.

( ) 2/3
(+) 3/2
( ) 5/2
( ) 7/2
( ) 9/4

Solution

$$\frac{ar^4}{ar} = \frac{81}{24}$$

$$r^3 = 27/8$$

$$\therefore r = 3/2$$

Question 45.

A family of 5 is to sit round a dining table. In how many different ways possible can they sit?

( ) 12
( ) 16
(+) 24
( ) 8
( ) 14

Solution

$$(n-1)! = (5-1)! = 4! = 4 \times 3 \times 2 \times 1 = 24$$

Question 46.

If Sin Θ= 1/3, Θ is acute. Find the value of tanΘ .

( ) $\sqrt{3}/2$

( ) $\sqrt{5}/4$

( ) $\sqrt{7}/5$

(+) $\sqrt{2}/4$

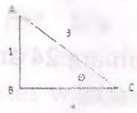
( ) $12/13$

Solution

$Sin\Theta = 1/3 = Opp/Hyp$

$|BC|^2 = |AC|^2 - |AB|^2 = 3^2 - 1^2 = 9 - 1 = 8$

$BC = \sqrt{8}$



$Tan\Theta = Opp/Adj$

$= 1/\sqrt{8} = \sqrt{2}/4$

Question 47.

An article bought for N8.75 was sold for N6.65. what is the percentage loss?

( ) 12%

( ) 15%

( ) 21%

(+) 24%

( ) 16%

Solution

$$Percentage_loss = \frac{8.75 - 6.65}{8.75} \times 100$$

$$= \frac{2.1}{8.75} \times 100 = 24\%$$

Question 48.

A student's annual interest on his savings account is N5,000. If the rate of interest is 9.5%, find the amount he deposited to the nearest Naira.

( ) N53.14

( ) N47.63

(+) N52.63

( ) N51.15

( ) N41.65

Solution

$$S.I = \frac{PRT}{100}$$

$$P = (5000 \times 100)/9.5 = 52.631$$

Where P=Principal , R=Rate, T=Time and S.I=Simple Interest

Question 49.

The percentage score of 10 students in a test are 12, 56, 42, 21, 25, 18, 10, 53, 42, 24.

What is the median score?

( ) 25.4

( ) 27.6

( ) 26.3

( ) 27.5

(+) 24.5

Solution

Median Score of 10, 12, 18, 21, 24, 25, 42, 42, 53, 56

$$= \frac{(24 + 25)}{2} = 24.5$$

2014

Question 1.

Simplify the expression

$\sqrt{48}+\sqrt{75}-\sqrt{243}$

(+) 0
( ) 3
( ) 12
( ) 1
( ) 2

Solution

$\sqrt{48}+\sqrt{75}-\sqrt{243}=\sqrt{(16\times3)}+\sqrt{(25\times3)}-\sqrt{(81\times3)}$

$=4\sqrt{3}+5\sqrt{3}-9\sqrt{3}=0$

Question 2.

Find the value(s) of x if $2^{x2+2}=4$

( ) 1 or 3
( ) 1 or 2
(+) 1 or -2
( ) 5
( ) 3 or 5

Solution

$2^{x2+2}=4=2^2$

$x^2+x=2; x^2+x-2=0$

$x(x-1)+2(x-1)=0$

$\therefore x=1,-2$

Question 3.

Find the value(s) of x

$\log(x^2+9)-2\log x=1$

( ) 1 or 2
( ) -1 or 3
( ) 1 or -2
(+) 1 or-1
( ) 2 or 3

Solution

$\log(x^2+9)-2\log x=1$

$\log\frac{x^2+9}{x^2}=\log10$

$10x^2=x^2+9;$

$x=\pm1$

Question 4.

What term of the arithmetic progression 2, 5, 8, . Is 44.

( ) 5
( ) 20
( ) 25
( ) 16
(+) 15

Solution

$a=2, d=3$

$T_n=a+(n-1)d;$

$44=2+(n-1)3$

$44-2=3(n-1)=42$

$42/3=n-1=14;$

$n=14+1=15$

Question 5.

If the numbers x, 2x+ 1, 5x-1 are in arithmetic progression, find the value of x.

(+) 1/2
( ) 2/3
( ) 6/3
( ) 2/5
( ) 3/2

Solution

$T_2-T_1=T_3-T_2$

$2x+1-x=5x-1-2x-1$

$x-1=3x-2;$

$\therefore x=1/2$

Question 6.

If a and b are the roots of the equation: Find the value a/b+b/a

$3x^2+5x-1=0$

( ) -21/9
( ) -11/7
( ) -31/9
(+) -31/3
( ) 9/5

Solution

$3x^2+5x-1$

$a=3, b=5, c=-1$

$a+b=-b/a;$

$ab=c/a$

$\frac{a^2+b^2}{ab}=\frac{b^2-2ac}{ac}$

$=\frac{25+6}{-3}=\frac{-31}{3}$

FLEXXMESOFT

Question 7.

Without using tables, find the value of Cos 105°.

( ) $\sqrt{3}/4\,(1 \quad \sqrt{3})$

( ) $\sqrt{2}/4\,(1-\sqrt{5})$

(+) $\sqrt{2}/4\,(1-\sqrt{3})$

( ) $\sqrt{3}$

( ) $(1-\sqrt{5})$

Question 8.

Simplify $\dfrac{\log 27+\log 8-\log 125}{\log 6-\log 5}$

( ) 5

( ) 7

(+) 3

( ) 9

( ) 25

Solution

$$\frac{\log 27+\log 8-\log 125}{\log 6-\log 5}=\frac{3\log 3+3\log 2-3\log 5}{\log 6-\log 5}$$

$$\frac{3(\log 6-\log 5)}{(\log 6-\log 5)}=3$$

Question 9.

What is the area of the sector which subtends angle of 30° at the centre of circle of radius 7cm.

( ) 11/6cm2

( ) 66/5cm2

( ) 79/6cm2

( ) 77/6cm2

(+) 77cm2

Solution

$$\text{Area of Sector}=\theta/360\times 22/7\times 7\times 7=77cm^2$$

Question 10.

If the scores 5, 8, 6 and 2 occur in a distribution with frequencies 3, 2, 4 and 1 respectively, find the arithmetic mean of the scores.

(+) 5.7

( ) 15.2

( ) 16.2

( ) 24

( ) 12

Solution

$$\frac{(5\times 3)+(8\times 2)+(66\times 4)+(2\times 1)}{10}=5.7$$

Question 11.

choose the option nearest in meaning to the underlined expression

The convict said he was tired of leading a dog's life. To lead a dog's life means

( ) carelessly

( ) in disgrace

( ) in solitude

(+) in misery

( ) in poverty

Question 12.

choose the option nearest in meaning to the *underlined expression*

He went through fire before he qualified as a doctor. The underlined expression means that he

( ) had a fire accident

( ) made a lot of fire

(+) suffered a lot

( ) underwent some purification

( ) required a lot of fire

Question 13.

Choose the option opposite in meaning to the word underlined

The increase in transport fares deterred our club from planning an excursion this year

( ) deferred

( ) irritated

( ) impelled

( ) restricted

(+) encouraged

Question 14.

choose the option opposite in meaning to the word underlined.

This card entitles you to attend the film show.

(+) disqualifies

( ) discourages

( ) disenchants

( ) proclaims

( ) satisfies

Question 15.

choose the option nearest in meaning to the word(s) or phrase(s) underlined

I am yet to write the penultimate paragraph of my essay.

(+) last but one
( ) third to the last
( ) second
( ) concluding
( ) introductory

Question 16.

choose the option nearest in meaning to the word(s) or phrase(s) underlined

Despite increasingly punitive laws against hemp smoking, it is still rising at an alarming rate.

( ) devastating
( ) exemplary
( ) barbarlc
(+) severe
( ) satisfactory

Question 17.

choose the expression or word which best completes each sentence.

I am looking .....seeing your family.

( ) ahead at
(+) ward to
( ) forward on
( ) for to
( ) ahead to

Question 18.

Choose the expression or word which best completes each sentence.

I was seriously disappointed when the..... between the two teams ended in a goalless draw.

( ) march
( ) marsh
(+) match
( ) mash
( ) martch

Question 19.

Choose from the options the word that has the same vowel sound as the one represented by the letter(s) underlined

Blood

( ) book
( ) block
( ) stock
(+) money
( ) took

Question 20.

Select the word that has the same pattern of stress as the given word

QUALITY

( ) guarantee
( ) accepted
( ) bachelor
(+) relation
( ) again

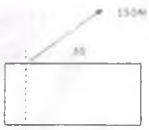
Question 21.

A force of 150N is attached to a mass of 200kg at an angle of 30° to drag it through a horizontal distance of 10m. how-much work is done by the force?

( ) 1200J
( ) 1300J
( ) 2000J
(+) 1299J
( ) 1290J

Solution

Work=Fcos30xdistance=150cos 30 x 10=1299N



Refer to Page 188 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 22.

A uniform meter stick is supported at the 25cm mark and maintained at equilibrium by a 10kg mass which is attached at 5cm mark. The mass of the meter rule is

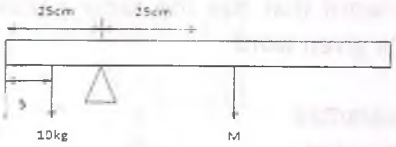
( ) 20kg
( ) 10kg
( ) 5kg
(+) 8kg
( ) 6kg

Solution

FLEXXMEJCET

$$10 \times 20 = M \times 25$$

$$M = 200/25 = 8kg$$



Refer to Page 149 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 23.

A 6uf capacitor is connected in series with a 5uf and 7uf which are connected in parallel. What is the equivalent capacitance of the network.

( ) 18uf
(+) 4uf
( ) 2uf
( ) 12uf
( ) 13uf

Solution

$$1/C = 1/6 + 1/(5+7)$$

$$= 1/6 + 1/12 = 3/12$$

$$\therefore C = 12/3 = 4\mu f$$

Refer to Page 387 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 24.

When two parallel wires carry currents in opposite direction, the force on either wire is

(+) away from the other wire
( ) zero, because the currents cancel each other
( ) twice as much as when the currents are in the same
( ) towards the other wire E. none of the above
( ) none of the above

Solution

The answer is "away from the other wire "

Refer to Page 379 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 25.

Some quantity of hot water at a temperature T is added to warm water at a temperature of 25°C in the ratio 1:4. Determine T if the final temperature of the mixture is 30°C.

(+) 50°C
( ) 35°C
( ) 55°C
( ) 5°C
( ) 10°C

$$Ratio = 1:4;\ finalTemp = 30^0C$$

$$25 \times 4 = 100;$$

$$x + 1 = x$$

$$30 = (x+100)/5;$$

$$x + 100 = 150$$

$$\therefore x = 150 - 100 = 50^0C$$

Refer to Page 214-224 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 26.

When the saturated pressure of a liquid becomes equal to the pressure of the air above it.

(+) the liquid boils
( ) the liquid evaporates
( ) dew begins to form
( ) the liquid condense
( ) none of the above

Solution

A liquid boils when the saturated pressure of a liquid becomes equal to the pressure of the air above it

Refer to Page 227 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 27.

Calculate the angle of incidence that will produce an angle of refraction of 36° for a light ray incident on glass if the velocities of the light in air and glass are 3.0 x 10^8m/s and 2.0 x 10^8m/s respectively.

( ) 72°
( ) 36°
( ) 180°
(+) 61.8°
( ) 90°

FLEXXMESU

Solution

$$\text{Re}\,fractiveIndex = \frac{v_a}{v_b} = \frac{3}{2} = 1.5$$

$$1.5 = \sin i / \sin r = \sin x / \sin 36$$

$$i = 61.8^0$$

Refer to Page 296 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 28.

An object is placed 30.0cm from a converging lens of focal length 12.0cm. Calculate the height of the object if the image formed is 4.0cm high

( ) 20cm
( ) 20m
( ) 200cm
(+) 6.0cm
( ) 4.0cm

Solution

$$u \sin g = \frac{1}{u} + \frac{1}{v} = \frac{1}{f}$$

$$\frac{1}{u} = \frac{1}{f} - \frac{1}{v}$$

$$\frac{1}{u} = \frac{1}{12} - \frac{1}{4}$$

$$\frac{1}{u} = \frac{4-12}{48}$$

$$\frac{1}{u} = \frac{-8}{48}$$

$$u = \frac{48}{-8}$$

$$u = -6.0cm$$

Refer to Page 286 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 29.

What is the length of an organ pipe open at both ends which will produce the same frequency note as a 75cm organ pipe closed at one end.

( ) 75cm
( ) 37.5cm
(+) 150cm
( ) 750cm
( ) 7.5cm

Solution

$$Closedpipe$$

$$f = \frac{v}{4l}$$

$$Openpipe$$

$$f = \frac{v}{2l}$$

$$\frac{1}{4l} = \frac{1}{2l}$$

$$\frac{1}{4 \times 75} = \frac{1}{2l}$$

$$2l = 300$$

$$l = \frac{300}{2}$$

$$l = 150cm$$

Refer to Page 336 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 30.

Which of the following is isotopes of hydrogen.

( ) ${}^{4}_{1}H$
( ) ${}^{5}_{1}H$
(+) ${}^{3}_{1}H$
( ) ${}^{6}_{1}H$
( ) ${}^{7}_{1}H$

Solution

The answer is ${}^{3}_{1}H$ also known as Tritium

Question 31.

Can hydrogen be used to reduce the oxide of Na?

( ) no
( ) Partial
(+) Yes
( ) insufficient
( ) Limited

Solution

The answer is "Yes"

Question 32.

The term atomic orbital refers to.....

( ) circular path
( ) elliptical path
(+) an energy level
( ) a volume of space
( ) a valence shell

Solution

The answer is "an energy level "

Refer to Page 141 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 33.

Which of these techniques are available for isolation and purification of compound.

(+) recrystallization
( ) halogenations
( ) homogination
( ) hexagonation
( ) hydration

Solution

The answer is "recrystallization"

Recrystallization is a technique used to purify chemicals. By dissolving both impurities and a compound in an appropriate solvent, either the desired compound or impurities can be coaxed out of solution, leaving the other behind. It is named for the crystals often formed when the compound precipitates out.

Refer to Page 16 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 34.

Which of the following does not represent alkane.

( ) C6H14
( ) C13H26
(+) C18H36
( ) C19H40
( ) C38H78

Solution

Hydrocarbons which contain only single bonds are called alkanes. They are called saturated hydrocarbons because there is a hydrogen in every possible location. This gives them a general **formula C_nH_{2n+2}**. The first four alkanes are **methane**, **ethane**, propane, and **butane** with the Lewis symbols shown below.

Refer to Page 530 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 35.

The higher homologues of alkanes are solids at

(+) 20°C
( ) -30°C
( ) -20°C
( ) 30°C
( ) -10°C

Solution

The answer is "20°C"

Question 36.

Calculate the oxidation number of Mn in MnO2

( ) 6
(+) 4
( ) 2
( ) 8
( ) 10

Solution

Mn in MnO2

Oxidation number of oxygen is -2

$$x + 2(-2) = 0$$

$$x - 4 = 0$$

$$x = +4$$

$$\therefore Mn = +4$$

Refer to Page190-191 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 37.

How many moles are there in 7.20g of H20

( ) 0.20
( ) 0.80
( ) 0.60
(+) 0.40
( ) 0.10

Solution

$$Mole = \frac{Reactingmass}{Molarmass}$$

$$Mole = \frac{7.2}{18} = 0.4moles$$

Refer to Page 30 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 38.

Which of these is not a physical property of metal?

( ) electrical conductivity
( ) instre
( ) ductile
( ) malleable
(+) resistant

Solution

Physical Properties. Metals differ so widely in hardness, ductility (the potentiality of being drawn into wire), malleability, tensile strength, density, and melting point that a definite line of distinction between them and the non-metals

cannot be drawn. The hardest elemental metal is chromium; the softest, caesium.
Refer to Page 442 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 39.

How many straight-chain dichloroalkanes correspond to the formula C4H5Cl2

(+) 4
( ) 5
( ) 6
( ) 7
( ) 8

Solution
The answer is "4"

Question 40.

What part of prawn is used specifically for sensory.

( ) carapace
( ) mandible
( ) trachea
( ) proboscis
(+) antennae

Solution
Antennae (singular: antenna), sometimes referred to as "feelers," are paired appendages used for sensing in arthropods.

Question 41.

The excretory organ of an earthworm is called .....

(+) nephridia
( ) flame cell
( ) malphigian tubule
( ) chloragogenus cells
( ) kidney

Solution
The answer is "Nephridia"
Refer to Page 24 Modern Biology by Sarajini T. Ramalingam, BSc(Hons.), PhD

Question 42.

Which of the following is not an essential nutrient for human?

( ) vitamin
(+) lysine
( ) glucose
( ) calcium
( ) iron

Solution
The answer is "Lysine"
Lysine is not an essential nutrient for humans, it is encoded by the codons AAA and AAG is an α-amino acid that is used in the biosynthesis of proteins. It contains an α-amino group, an α-carboxylic acid group, and a side chain lysyl, classifying it as a charged, aliphatic amino acid.

Question 43.

A typical animal cell consists of all except

(+) chloroplast
( ) nucleus
( ) cell wall
( ) protoplasm
( ) cytoplasm

Solution
The answer is "Chloroplast"
Refer to Page 224 Modern Biology by Sarajini T. Ramalingam, BSc(Hons.), PhD

Question 44.

Malphighian tubules are excretory organs found in

( ) vertebrate
(+) insects
( ) flatworms
( ) annelids
( ) jelly fish

Solution
Malphigian tubules are found in insects
Refer to Page 338 Modern Biology by Sarajini T. Ramalingam, BSc(Hons.), PhD

Question 45.

Which base replaces thymine (T) in base sequence of messenger RNA (Mrna)?

( ) Adenine (A)
( ) guanine (G)
( ) Cytocine (C)
(+) Uracil (U)
( ) both Guanine and cytocine

Solution
Uracil is energetically less expensive to produce than thymine, which may account for its use in RNA. Thus, uracil is appropriate for RNA, where quantity is important but lifespan is not, whereas thymine is appropriate for DNA where

maintaining sequence with high fidelity is more critical.

Question 46.

Which vertebrae maintains the right and proper gait of the body?

( ) caudal vertebrae
( ) lumber vertebrae
( ) sacral vertebrae
( ) axis vertebral
(+) cervical vertebrae

Solution

In vertebrates, **cervical vertebrae** (singular **vertebra**) are the **vertebrae** of the neck, immediately below the skull. Thoracic **vertebrae** in all mammalian species are those **vertebrae** that also carry a pair of ribs, and lie caudal to the **cervical vertebrae**

Refer to Page 267 Modern Biology by Sarajini T. Ramalingam, B.Sc. (Hons.), PhD

Question 47.

A fruit is most commonly

(+) a mature ovary
( ) a thickened style
( ) an enlarged ovule
( ) a modified root
( ) a mature female gametophyte

Solution

The answer is matured ovary

Refer to Page 495 Modern Biology by Sarajini T. Ramalingam, BSc(Hons.), PhD.

Question 48.

Which of the following is not recycled in an ecosystem?

( ) water
(+) energy
( ) carbon
( ) nitrogen
( ) all

Solution

The answer is "energy "

Question 49.

Movement of substance across cell membrane is controlled by the

( ) size of permeat particle
(+) permeability of membrane
( ) membrane proteins
( ) both B and C
( ) all

Solution

The cell membrane (also known as the plasma membrane or cytoplasmic membrane) is a biological membrane that separates the interior of all cells from the outside environment. The cell membrane is selectively permeable to ions and organic molecules and controls the movement of substances in and out of cells.

Refer to Page 222 Modern Biology by Sarajini T. Ramalingam, BSc (Hons.), PhD

FLEXXMESOFT

2013

Question 1.

Density of NH3 at 373K and 1.15atm pressure is (R = 0.082atm-dm-3k·1mol)

( ) 0.56g1dm3
(+) 1.56g1dm3
( ) 5.26g/dm3
( ) 3.56g1dm3
( ) 0.26g1dm3

Solution

Temperature=373k, Pressure=1.15atm, R=0.082atm-dm-3/k-mol
Molar mass of NH3=14+3(1)=17g/mol, density of NH3=?

$$\therefore Density of NH_3 = \frac{373k / 1.15atm \times 0.082atm / 3}{17g/mol}$$

$$= 26.596 / 17g/dm^3 = 1.56g/dm^3$$

Refer to Page 85 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 2.

Calculate the number of moles of chlorine contained in 3.52 x 10^24atom

( ) 6.46moles
(+) 5.85moles
( ) 3.74moles
( ) 8.45moles
( ) 4.85mo1e

Solution

$$No.of moles = \frac{noofatoms}{N_A} = \frac{3.52\times10^{24}}{6.02\times10^{23}} = 5.85moles$$

Refer to Page 87 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 3.

Gold has a molar mass of 197g/mole.If a sample of it contains 9.70 x 10^23atoms,what is the mass of this sample of Gold.

( ) 191.09g
( ) 203.09g
( ) 122.30g
( ) 185.35g
(+) 317.32g

Solution

$$\frac{reactingmass}{molarmass} = \frac{noofatoms}{N_A}$$

$$given mass = \frac{molarmass \times noofatoms}{N_A} = \frac{197\times9.70\times10^{23}}{6.02\times10^{23}}$$

$$= 317.32g$$

Refer to Page 87 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 4.

Nitrogen is a diatomic molecule formed covalently by sharing electrons. The number of electrons shared to form this bond is

( ) 3
( ) 2
( ) 6
( ) 5
(+) 4

Solution

The answer is "4"

Question 5.

2000L of gas at 20°C is heated to a temperature of 35°C, its final volume is

( ) 1500L
(+) 2102.3L
( ) 1805.2L
( ) 3205.1L
( ) 2105.2L

Solution

initial volume V1 = 2000L
Initial temperature T1= 20C = 293K
Final temperature, T2 = 35C = 308K
Final volume, V2 = ?

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

$$V_2 = \frac{V_1 \times T_2}{T_1} = \frac{2000\times308}{293} = \frac{616000}{293} = 21024L$$

Refer to Page 82 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

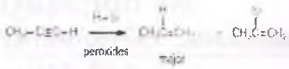
Question 6.

How many grams of HBr would exactly be required to react with 2g of propyne? (C = 12, H = 1, Br = 80).

(+) 4.1g
( ) 6.1g
( ) 10.1g
( ) 8.1g

( ) 16.2g

Solution



From the equation

1 mole of Propyne reacts with 1 mole of Hydrogen Bromide(HBr

Mass of 1 mole of propyne =12+3(1)+12+12+1=40

Mass of 1 mole of Hydrogen Bromide (HBr)=1+80=81

40g of Propyne reacts with 81g of HBr.

2.0g of Propyne reacts with $\frac{2}{40} \times 81 = 4.05 \cong 4.1 g HBr$

Refer to Page 40, 159-164 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 7.

If an organic compound decolorizes bromine water then the compound is

( ) saturated

( ) super saturated

(+) unsaturated

( ) solid

( ) prorogated

Solution

The organic compound is unsaturated

Refer to Page 534 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 8.

How much of magnesium is required to react with 25Ocm3 of 0.5M HCI?

( ) 0.3g

(+) 1.5g

( ) 2.4g

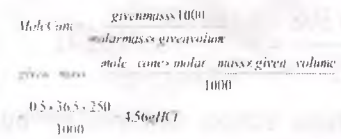
( ) 3.0g

( ) 2.5g

Solution

Reaction equation: Mg + 2HCI MgCl2 + 2H

To determine, the mass of HCI, we use the relation



From the reaction equation, 1mole of Mg requires 2 mole of HCI

24g Mg require 2(36.5)g HCI

∴ Xg of Mg will require 4.56g of HCI [cross multiply]

$$x_g = \frac{24 \times 4.56}{2(36.5)} = 1.5g$$

Refer to Page 159-164 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 9.

The densities of two gases, x and y, are 0.5g1dm3 and 2.0g/dm3 respectively. What is the rate of diffusion of x relative to y?

( ) 0.1

( ) 0.5

( ) 3.0

( ) 4.0

(+) 2.0

Solution

$$\frac{R_x}{R_y} = \frac{\sqrt{d_y}}{\sqrt{d_x}} = \frac{\sqrt{2}}{\sqrt{0.5}} = \sqrt{4} = 2$$

Refer to Page 90 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 10.

What volume of 1.5M solution of KOH would contain 0.045 moles?

(÷) 67.50cm3

( ) 30.00cm3

( ) 6.75cm3

( ) 3.00cm3

( ) 20.0Ocm3

Solution

$$Mole_Conc = \frac{number_of_moles}{Volume_in_dm^3}$$

$Volume = 1.5 \times 0.045 = 0.0675 dm^3 or$

$67.5 cm^3$

Refer to Page 159-164 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 11.

Root hairs are developed from the

( ) root apex

(+) epidermis of root

( ) vascular bundles

( ) endodermis

( ) pericycle

Solution

A root hair, or absorbent hair, the rhizoid of a vascular plant, is a tubular outgrowth of a trichoblast, a hair-forming cell on the epidermis of a plant root. As they are lateral extensions of a single cell and only rarely branched, they are invisible to the naked eye.

Question 12.

In the onion bulb, food is stored in the

( ) stem
( ) lateral buds
( ) cotyledons
( ) outer scale leaves
(+) leaf bases

Solution

The onion, part of the Lily family stores food in the Leaf base, which are long and tubular. With mostly all varieties of onion the leaves along with the bulb are edible. Chives and green onions are a common example. the leaves, which store sugars and pungent oils are what give the bulb it's strong Oder and flavor.

Question 13.

Mycelium is a characteristic feature of

( ) mosses
(+) moulds
( ) hydra
( ) bacteria
( ) yeast

Solution

Mycelium is the vegetative part of a fungus, consisting of a mass of branching, thread-like hyphae. The mass of hyphae is sometimes called shiro, especially within the fairy ring fungi. Fungal colonies composed of mycelium are found in and on soil, moulds and many other substrates.

Question 14.

What is the probability of producing a child of blood group "O" by a woman of blood group "O" and a man of blood "A"?

(+) 50%
( ) 25%
( ) 20%
( ) 5%
( ) 100%

Solution

Refer to Page 548 Modern Biology by Sarajini T. Ramalingam, BSc(Hons.), PhD (Sixth Edition) 2013

Question 15.

The part of the nervous system that interprets blinking of the eyes is the

( ) hind brain
( ) cerebellum
(+) cerebrum
( ) spinal cord
( ) olfactory lobe

Solution

The answer is "cerebrum "

Refer to Page 410 Modern Biology by Sarajini T. Ramalingam, BSc(Hons.), PhD (Sixth Edition) 2013

Question 16.

if a DNA strand has a base sequence AGT, its complementary strand must be

( ) TCA
( ) CAT
( ) TAG
(+) ATG
( ) AGC

Solution

The answer is "ATG "

Refer to Page 554 Modern Biology by Sarajini T. Ramalingam, BSc(Hons.), PhD (Sixth Edition) 2013

Question 17.

Animal saprotrophs are called

(+) saprophytes
( ) mucorheimalis
( ) saprophytism
( ) lichens
( ) saprozoites

Solution

The answer is "saprophytes"

A saprophyte or saprotroph is an organism which gets its energy from dead organic matter. This may be decaying pieces of plants or animals. This means that saprophytes are heterotrophs. They are consumers in the food chain.

Question 18.

The blue-green algae belongs to the kingdom.

( ) plantae
( ) mycophyta
(+) monera
( ) bryophyte
( ) pteridophyta

Solution

The answer is "monera"

Question 19.

Partially digested food ready to leave the stomach is referred to as

( ) Curd
( ) Glycogen
( ) Paste
(+) Chyme
( ) Roughage

Solution

Chyme or chymus (/kaɪm/ from Greek χυμός khymos "juice") is the semifluid mass of partly digested food that is expelled by the stomach into the duodenum (the beginning of the small intestine). Chyme is the liquid substance found in the stomach before passing through the pyloric valve and entering the duodenum

Refer to Page 292 Modern Biology by Sarajini T. Ramalingam, BSc(Hons.), PhD. (Sixth Edition) 2013

Question 20.

Which of the following organs regulate the amount of amino acids and glucose in the body?

( ) Kidney
(+) Liver
( ) Pancreas
( ) Spleen
( ) Stomach

Solution

The answer is "Liver "

Question 21.

Obi and..... participated in the tournament.

(+) him
( ) his
( ) he
( ) her
( ) hers

Question 22.

Emeka is one of the boys who always .....good work.

(+) does
( ) would do
( ) done
( ) should do
( ) do

Question 23.

The policemen who were to keep watch connived .....robbers to escape.

(+) with
( ) at
( ) to
( ) for
( ) as

Question 24.

He claimed that Mr Okoli's utterance was tantamount to defamation of character, so he sued for .....

( ) damage
( ) some damage
( ) a damage
(+) damages
( ) damages'

Question 25.

The teacher with his wife .....here

( ) were
( ) were to be
(+) are
( ) was
( ) are to be

Question 26.

We ought to have visited the Governor, ... ?

( ) isn't it
(+) oughtn't we
( ) shouldn't we
( ) haven't we
( ) don't we

Question 27.

The class..... more girls than boys this session

( ) comprised of
(+) comprises of
( ) comprise
( ) comprises
( ) consists

Question 28.

By twelve midnight, we will be..... en route to Britain

( ) airbourned
(+) airborne
( ) air borned
( ) airbourne
( ) air bourned

Question 29.

My friend's car has..... to a halt.

( ) grinded
(+) grounded
( ) ground
( ) grind
( ) grinding

Question 30.

The match gave the team a chance to show their .....

( ) worth
( ) position
(+) prowess
( ) power
( ) mettle

Question 31.

The binary operation * is defined on the set of integers such that x + y = xy + x - y. find 2*(3*4).

( ) 11
(+) 13
( ) 25
( ) 22
( ) 23

Solution

Given: x+y=xy+x-y

3*4 = (3 x 4) + 3 - 4 = 11

2*(3*4) = 2*11 = (2 x 11) + 2 - 11 = 24 - 11 = 13

Question 32.

Find x if $\log_x^9 + \log_x^{2.3} = 2.5$

( ) 2
(+) 3
( ) 4
( ) 2.5
( ) 1

Solution

$$\log_x^9 + \log_x^{2^3} = 2.5 = 2\log_x^3 + \tfrac{1}{2}\log_x^3 = \tfrac{5}{2}$$

$$\tfrac{5}{2}\log_x^3 = \tfrac{5}{2}$$

$$x^{5/2} = 3^{5/2}$$

$$\therefore x = 3$$

Question 33.

Find the values of a if the equation

$(5a+1)x^2 - 8ax + 30 = 0$ has equal roots

( ) (-3, 0)
( ) (3, 0)
( ) (2,3)
(+) (-2,3)
( ) (-2, -3)

Solution

for equal roots,

$$b^2 = 4ac$$

$$\therefore a = (-2,3)$$

Question 34.

What is the value of k if (x - 3) is a factor of

$2x^3 + kx^2 - 5x + 6$

(+) -5
( ) 5
( ) -45
( ) 6
( ) -6

Solution

$$2x^3 + kx^2 - 5x + 6 = 0$$

put x=3 $\quad 2(3)^3 + k(3^2) - 5(3) + 6 = 0$

$$54 + 9k - 15 + 5 = 0$$

$$k = -45/9 = -5$$

Question 35.

If the angles of hexagon are x°,(x + 10)°, (x + 20)°, (x + 30)°, (x + 40)°, and (x + 50)°, then x is

(+) 95°
( ) 20°
( ) 90°
( ) 65°
( ) 45°

Solution

The answer is "95° "

Question 36.

Simplify

$(225^{1/2} + 85)x256^{-1/4}$

( ) 2
(+) 4
( ) -2
( ) -4
( ) 1

Solution

$$\left(225^{1/2} + 85^0\right) \times 256^{-1/4}$$

$$= \sqrt{225} + 85^0 + \frac{1}{\sqrt[4]{256}}$$

$$= 15 + 1 \times 1/4 = 4$$

Question 37.

Find the turning point of the functions

$2x^3 + 3x^2 - 36x + 10$

( ) (2, 3)

( ) (-2,3)
(+) (2, -3)
( ) (-2, 3)
( ) None of the above

Solution

None of the above

Turning points of a function is the same as the stationary points,

it helps in dipicting the maximum and minimum points of an equation

Question 38.

In how many ways can 3 boys and 2 girls sit in a row, if just the girls are to sit together?

( ) 120
( ) 24
( ) 48
( ) 36
(+) None of the above

Solution

$$\binom{5}{2} = \frac{5}{2!3!} = \frac{5\cdot4\cdot3\cdot2\cdot1}{2\cdot1\cdot3\cdot2\cdot1} = \frac{120}{12} = 10$$

Question 39.

The value of

$$\lim_{x \to 0} \frac{1-\cos x}{1-\sin x}$$

( ) 1
(+) 0
( ) -1
( ) 0.5
( ) 2

Solution

$$\frac{1-\cos(0)}{1-\sin(0)}$$

$$\frac{1-1}{1} = \frac{0}{1} = 0$$

Question 40.

A car traveling at 50km/hr decelerates uniformly at 1.8m/s2. Calculate the distance it travels before it stops.

( ) 1.80m
( ) 50.0m
(+) 53.59m
( ) 55.39m
( ) 5.35m

Solution

$$V = 50km/hr = 50 \times {}^{1000}/_{3600} = 13.89$$

$$a = 1.8m/s^2, d = ?$$

$$d = {}^{v^2}/_{2a} = 13.89^2/2(1.8) = {}^{192.9}/_{3.6} = 53.59m$$

Question 41.

A body of mass 50kg slides down freely on a frictionless plane which is inclined at an angle of 30° to the horizontal. What force is pushing the body down the incline?

( ) 542N
( ) 200N
(+) 245N
( ) 50N
( ) 30N

Solution

The answer is "245N"

Question 42.

A 15g bullet traveling at 100m/s strikes and is absorbed by a 75kg object. Find the speed at which the final object moves.

( ) 75.015m/s
( ) 75m/s
( ) 100m/s
( ) 0.02m/s
(+) 50.01m/s

Solution

The answer is "50.01m/s"
Let the final velocity of bullet be U m/s
Momentum before impact=0.015x100
Total mass of bullet and block=75.015kg
from conservation of linear momentum:

$$u = \frac{75.015}{1.5} = 50.01m/s$$

Question 43.

A car moves at a uniform speed of 40m/s, if the force exerted by the engine on the car is 4000N, what is the power of the automobile?

( ) 114hp
(+) 214hp
( ) 314hp
( ) 514hp
( ) 414hp

Solution

$v = 40m/s, f = 400N, p = ?$

$p = workdone/time = f \times s/t = fv = 40 \times 4000 = 160{,}000w$

$1hp = 746w$

$xhp = 160{,}000w$

$\therefore x = 160000/746 = 214.48hp$

Question 44.

In a hydraulic press, the pump piston exerts a pressure of 100Pa on the liquid. What force is exerted in the second piston of cross-sectional area 3m2?

(+) 300N
( ) 200N
( ) 150N
( ) 100N
( ) 600N

Solution

The answer is "300N"
Force(f)=Pressure x Area

$$F = P \times A = 100 \times 3 = 300N$$

Question 45.

A sealed flask contains 600cm3 of air at 27. it is heated to 35c at a constant pressure.
The new volume of air is.

( ) 508cm3
( ) 516cm3
( ) 608cm3
( ) 603cm3
(+) 616cm3

Solution

$V_1 = 600cm^3, T_1 = 27^0c = 300k, T_2 = 35^0c = 308k, V_2 = ?$

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

$$\therefore V_2 = \frac{V_1 \times T_2}{T_1} = 616cm^3$$

Question 46.

A real image three times the size of an object is formed 24cm from a converging mirror.
What is the focal length of the mirror?

( ) 6cm
(+) 8cm
( ) 12cm
( ) 16cm
( ) 24cm

Solution

The answer is "8cm"

Question 47.

An electrical device is rated 1500W and its resistance is 375ohms. The current it will draw is

( ) 0.10A
( ) 4.00A
( ) 0.40A
( ) 77.50A
(+) 2.00A

Solution

$P = 1500W, R = 375\Omega$

$P = I^2R$

$I^2 = 1500/375 = 4$

$I = \sqrt{4} = 2A$

Question 48.

Three inductors of inductances 5mH, 10mH and 20mH are connected in series. The effective inductance is:

( ) 2.90mH
( ) 0.35mH
( ) 3.5mH
(+) 35.00mH
( ) 29.0Mh

Solution

$5 + 10 + 20 = 35mH$

Refer to Page 456 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 49.

The amount of energy released when O.5kg of uranium is burnt completely is

(+) $4.5x10^{16}$
( ) $1.5x10^{16}J$
( ) $1.5X10^{8}J$
( ) $4.5X10^{18}J$
( ) $4.5X10^{8}J$

Solution

$E = mc^2$
$E = 0.5 \times (3.0 \times 10^8)^2$
$4.5 \times 10^{16} J$

2012

Question 1.

A gas occupies 30.00dm3 at S.T.P. what volume would it occupy at 91°c and 350mmHg

( ) 20.0dm3
( ) 40.0dm3
( ) 60.0dm3
(+) 80.0dm3
( ) 100.0dm3

Solution

$V_1 = 30dm^3, T_1 = 273k, P_1 = 760mmHg, T_2 = 91^0c = 91 + 273 = 364k,$
$P_2 = 380mmHg, V_2 = ?$

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$$

$$V_2 = \frac{760 \times 30 \times 364}{380 \times 273} = 80dm^3$$

Refer to Page 81 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 2.

28.8cm3 of nitrogen at 15°C is cooled to 0°C at constant pressure, the new volume of nitrogen is

( ) 17.4cm3
( ) 14.7cm3
(+) 27.3cm3
( ) 31.7cm3
( ) 34.7cm3

Solution

$V_1 = 28.8cm^3, T_1 = 15^0c = 15 + 273 = 288k, T_2 = 0^0c = 273k, V_2 = ?$

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

$$\therefore V_2 = \frac{V_1T_2}{T_1} = \frac{28.8 \times 273}{288} = 27.3cm^3$$

Refer to Page 81 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 3.

If 24.83cm3 of 0.15M NaOH is titrated to its end point with 39.45cm3 of HCl, what is the molality of the HCL?

(+) 0.094M
( ) 0.150M
( ) 0.940M
( ) 1.500M
( ) 0.091 M

Solution

$$NaOH + HCl \rightarrow NaCl + H_2O$$

$$\frac{C_AV_A}{C_BV_B} = n$$

$$C_A = \frac{C_BV_B \times n}{V_A} = \frac{0.15 \times 24.83 \times 1}{39.45} = 0.094M$$

Question 4.

What volume of a 0.1M H3P04 will be required to neutralize 45.0cm3 of a 0.2M NaOH?

( ) 40.0cm3
( ) 10.0cm3
( ) 20.0cm3
( ) 27.0cm3
(+) 30.0cm3

Solution

$$H_3PO_{4(aq)} + 3NaOH_{(aq)} = Na_3PO_{4(aq)} + 3H_2O_{(l)}$$

$$\frac{C_AV_A}{C_BV_B} = \frac{1}{3}$$

$$V_A = \frac{C_BV_B \times 0.333}{C_A} = \frac{0.2 \times 45 \times 0.333}{0.1}$$

$$29.97 \cong 30cm^3$$

Question 5.

What is the concentration of H+ ions in moles per dm3 of a solution of pH 4.398?

(+) $4.0X10^{-5}$
( ) $0.4X10^{-5}$
( ) $4.0x10^{-3}$
( ) $0.4x10^{-3}$
( ) $0.4x10^{-2}$

Solution

$$P^H = -\log_{10}[H^+] = 4.398 = -\log_{10}[H^+]$$

$$[H^+] = 10^{-4.398} = 10^{-5} \times 10^{0.602} = 4.0 \times 10^{-5}$$

Refer to Page 104 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 6.

What volume of 11.0M hydrochloric acid must be diluted to obtain 1dm3 of 0.05M acid?

( ) 0.05dm3
( ) 0.10dm3
(+) 0.55dm3
( ) 11.0dm3
( ) 0.15dm3

Solution

Recall

$c = n/v$

Where c=Concentration
n=Number of moles
V=volume per dm3

$$\frac{\frac{n_1}{v_1}}{\frac{n_2}{v_2}} = \frac{n_1}{v_1} \times \frac{v_2}{n_2} = \frac{11.0}{v_1} = \frac{1}{0.05}$$

$$v_1 = 11.0 \times 0.05 = 0.55dm^3$$

Question 7.

A given mass of gas occupies 2dm3 at 300k. At what temperature will its volume be doubled keeping the pressure constant?

( ) 400k
( ) 450k
( ) 550k
(+) 600k
( ) 500k

Solution

$$V_1 = 2dm^3, T_1 = 300k, V_2 = 4dm^3, T_2 = ?$$

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

$$T_2 = \frac{T_1 V_2}{V_1} = \frac{300 \times 4}{2} = 600k$$

Refer to Page 81New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 8.

How many moles of oxygen molecules would be produced from the decomposition of 2.5moles of potassium trioxochlorate (v)?

( ) 2.50
( ) 3.50
(+) 3.75
( ) 7.50
( ) 2.75

Solution

The answer is "3.75 "

Question 9.

The carbon atoms of ethane are

( ) Sp2 hybridized
(+) Sp3 hybridized
( ) Sp2dhybridized
( ) Sp hybridized
( ) Sd hybridized

Solution

The answer is "Sp3 hybridized "

Question 10.

A stone is thrown with a velocity of 50m/s upwards from a point 20m above the ground, when does the stone reach its maximum height?

( ) 0.51 s
( ) 9.8s
( ) 5.1s
(+) 5.0s
( ) 5.2s

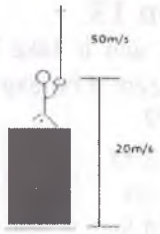
Solution

$$v = u + at$$

$$50 = 0 + 10t$$

$$t = \frac{50}{10}$$

$$t = 5s$$



Refer to Page 16 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015 .

Question 11.

A simple pendulum with a period of 2.0s has its length doubled. Its new period is

( ) 4.00s
(+) 2.83s
( ) 0.35s
( ) 1.00s
( ) 1.41s

Solution

$$L = gt^2/4\pi^2$$

$$L = \frac{9.8 \times 2^2}{4 \times 3.142^2}$$

$$L = \frac{9.8 \times 4}{4 \times 9.87}$$

$$L = 1$$

When

$2l$

$$\therefore T^2 = 4\pi^2/g$$

$$T = \sqrt{\frac{4\pi^2}{g}}$$

$$T = \sqrt{\frac{2 \times 39.47}{9.8}}$$

$$T = 2.83s$$

Refer to Page 174 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 12.

A rope is being used to pull a mass of 10kg vertically upward. Determine the tension in the rope if starting from rest, the mass acquires a velocity of 4m/s in 5s

(+) 5N
( ) 95N
( ) 50N
( ) 105N
( ) 40N

Solution

$$f = \frac{mv - mu}{t}$$

$$f = \frac{mv - 0}{t} = \frac{mv}{t} = \frac{10 \times 4}{8} = 5.0N$$

Question 13.

How long will it take a 60kg man to climb a height of 22m if he expended energy at the rate of 0.25kW?

(+) 52.8s
( ) 5.3s
( ) 34.5s
( ) 41.6s
( ) 52.2s

Solution

$$m = 10kg, h = 22m, p = 0.25kw = 250w, T = ?$$

$$p = \frac{workdone}{time} = \frac{mgh}{t}$$

$$Time = \frac{60 \times 10 \times 22}{250} = 52.8s$$

Refer to Page 32 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 14.

Hot water added to three times its mass ,of water at 10°c and resulting temperature is 20°c. what is the initial temperature of the hot water?

( ) 40°C
( ) 50°C
( ) 80°C
( ) 100°C
(+) 30°C

Solution

The answer is "30°C"

Question 15.

If the refractive index of a medium is 2, what is its critical angle?

( ) 45°
(+) 30°
( ) 60°
( ) 25°

Solution

$$n = \frac{1}{\sin C}$$

$$SinC = \frac{1}{n} = \frac{1}{2} = 0.5$$

$$\therefore C = \sin^{-1}(0.5) = 30^0$$

Question 16.

The energy in a capacitor of capacitance 5 microfarad is 40J. What is the voltage applied across its terminals?

(+) 4V
( ) 6V
( ) 200V
( ) 16V
( ) 4000v

Solution

$$E = \frac{1}{2}CV^2 = 40$$

$$V^2 = \frac{40}{0.5 \times 5} = 16$$

$$V = \sqrt{16} = 4V$$

Question 17.

The energy stored in an inductor of inductance 5mH when a current of 6A flows through it is

( ) $1.8x10^{-2}J$
(+) $9.0x10^{-2}$
( ) $9.0x10^{-3}$
( ) $1.4x10^{-2}J$
( ) NONE

Solution

Question 12.

A rope is being used to pull a mass of 10kg vertically upward. Determine the tension in the rope if starting from rest, the mass acquires a velocity of 4m/s in 5s

(+) 5N
( ) 95N
( ) 50N
( ) 105N
( ) 40N

Solution

$$f = \frac{mv - mu}{t}$$

$$f = \frac{mv - 0}{t} = \frac{mv}{t} = \frac{10 \times 4}{8} = 5.0N$$

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(+) 52.8s
( ) 5.3s
( ) 34.5s
( ) 41.6s
( ) 52.2s

Solution

$$m = 10kg, h = 22m, p = 0.25kw = 250w, T = ?$$

$$p = \frac{workdone}{time} = \frac{mgh}{t}$$

$$Time = \frac{60 \times 10 \times 22}{250} = 52.8s$$

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( ) 40°C
( ) 50°C
( ) 80°C
( ) 100°C
(+) 30°C

Solution

The answer is "30°C"

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( ) 25°

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( ) $1.8x10^{-2}J$
(+) $9.0x10^{-2}$
( ) $9.0x10^{-3}$
( ) $1.4x10^{-2}J$
( ) NONE

Solution

Solution

$3^{x+3} - 3^{x+2} - 3^{x+1} + 1 = 0$

$(3^x)^3 \times 3^3 - (3^x)^2 \times 3^2 - (3^x) \times 3 + 3^0 = 0$

$Let M = 3^x$

$27M^3 - 9M^2 - 3M + 1 = 0;$

$27M^3 - 12M + 1 = 0$

$(27M^3 - 9M)(-3M + 1) = 0$

$(9M - 1)(3M - 1) = 0$

$\therefore M = 1/9 \; or \; M = 1/3$

$But M = 3^x, when M = 1/9 = 3^{-2}$

$3^x = 3^{-2}; x = -2$

$when M = 1/3 = 3^{-1}$

$3^x = 3^{-1}$

$x = -1$

$\therefore (-2, -1)$

Question 24.

What is the quotient and remainder when x + 2 divides $2x^2 - 3x + 2$?

( ) (x + 2,16)
( ) (x + 2, 2x -7)
(+) (2x -7,16)
( ) (2x + 7,16)
( ) (2x - 7,16)

Solution

$$\begin{array}{r} 2x - 7 \\ x + 2 \overline{\big) 2x^2 - 3x + 2} \\ 2x^2 + 4x \\ -7x + 2 \\ -7x + 14 \\ \hline 16 \end{array}$$

$(2x - 7, 16)$

Question 25.

What is the point of intersection between the lines y = 3x + 2 and 2x + 3y = 17?

(+) P(1, 5)
( ) P(5, 1)
( ) P(2, 3)
( ) P(2, 17)
( ) P(-1, -5)

Solution

$y = 17 - 2x/3, and$

$y = 3x + 2$

$17 - 2x/3 = 3x + 2$

$17 - 2x = 9x + 6;$

$11 = 11x$

$\therefore x = 11/11 = 1$

$y = 3x + 2 = 3(1) + 2 = 5$

$(1,5)$

Question 26.

Evaluate $(2^0 + 4^{-1/2})^2$

( ) 2
( ) 4
(+) 9/4
( ) 5
( ) 1

Solution

$$(2^0 + 4^{-1/2})^2 = (1 + 1/\sqrt{4})^2 = (1 + 1/2)^2 = (3/2)^2 = 9/4$$

Question 27.

If cos a = sin a, then a is

( ) 30°
(+) 45°
( ) 60°
( ) 90°
( ) 0°

Solution

$$\cos 45^0 = 0.7071$$

$$\sin 45^0 = 0.7071$$

Question 28.

What is the probability of obtaining a total of 5 or 11 when a die is cast twice?

(+) 1/6
( ) 1/9
( ) 1/18
( ) 1/12
( ) None of the above

Solution

Possible Outcomes: 11 12 13 14 15 16
21 22 23 24 25 26
31 32 33 34 35 36
41 42 43 44 45 46
51 52 53 54 55 56

Prob(sum of 5 or 11) $= 4/36 + 2/36 = 1/6$

Question 29.

What is the first derivative of

$\frac{3+2x-x^2}{6}$

(+) 1/3(1 - x)
( ) 1/3(1 + x)
( ) 1/3(X- 1)
( ) 1/3(x - 2)
( ) 1/3(x+ 1)

Solution

$$y = \frac{3+2x-x^2}{6} = \frac{3}{6} \times \frac{2x}{6} - \frac{x^2}{6}$$

$$\frac{1}{2} + \frac{1}{3}x - \frac{x^2}{6} = \frac{1}{3} - \frac{x}{3} = \frac{1}{3}(1-x)$$

Question 30.

Four engineers..... On the system since March.

( ) worked
( ) are working
( ) had worked
(+) have been working
( ) has been working

Question 31.

I sent .....news to the press yesterday.

( ) parcel
( ) a flash
( ) a number
( ) a parcel
(+) an item

Question 32.

The police..... happy about the dwindling crime rate.

(+) says they are
( ) say it
( ) says it is
( ) say they are
( ) says you are

Question 33.

The workers suffered a lot, toiling .....the sun.

( ) in
(+) under
( ) underneath
( ) inside
( ) on

Question 34.

He is one of those who..... in my school.

(+) teaches
( ) is teaching
( ) are teaching
( ) has taught
( ) teach

Question 35.

Those men helped Ngozi and .....

( ) myself
(+) I
( ) me
( ) We
( ) he

Question 36.

A university teacher is an .....

( ) academic
( ) academics
(+) academician
( ) academia
( ) none of the above

Question 37.

It is high time we..... home.

( ) go
(+) went
( ) are going
( ) gone
( ) have gone

Question 38.

If one Perceivers .....will surely succeed.

( ) she
(+) one
( ) he
( ) they
( ) it

Question 39.

By this time next year, I..... Twenty years old.

( ) would have been
(+) will be
( ) could have been
( ) will have been
( ) could be

Question 40.

In an ecosystem, animal which feed directly on plants are called

( ) Secondary consumer
(+) primary consumer
( ) producer
( ) predators
( ) none of the above

Solution

Primary consumers are animals that eat primary producers; they are also called herbivores (plant-eaters). Secondary consumers eat primary consumers. They are carnivores (meat-eaters) and omnivores (animals that eat both animals and plants).

Question 41.

Movement and position of the head in man are detected by the

( ) cochea
( ) malleus
( ) utriculus
(+) semicircular canals
( ) outer ear

Solution

The semicircular canals are part of the inner ear. They are lined with cilia (microscopic hairs) and filled with a liquid substance, known as endolymph. Every time the head moves, the endolymph moves the cilia. This works as a type of motion sensor, as the movements of the cilia are communicated to the brain.

Question 42.

In the fish the sense organs which detect movement in the water are located within the

( ) gills
( ) operculum
( ) nostril
( ) median fins
(+) lateral line

Solution

The lateral line is a system of sense organs found in aquatic vertebrates used to detect movement and vibration in the surrounding water. The sensory ability is achieved via modified epithelial cells, known as hair cells, which respond to displacement caused by motion and transduce these signals into electrical impulses via excitatory synapses. Lateral lines serve an important role in schooling behavior, predation, and orientation. For example, fish can use their lateral line system to follow the vortices produced by fleeing prey.

Question 43.

The male toad differs from the female by having

(+) vocal sacs
( ) shorter hind limbs
( ) longer fore limbs
( ) bulging eyes
( ) nitrating membrane

Solution

The vocal sac is the flexible membrane of skin possessed by most male frogs. The purpose of the vocal sac is usually as an amplification of their mating or advertisement call. The presence or development of the vocal sac is one way of externally determining the sex of a frog in many species.

Question 44.

Which of these animals is NOT metamerically segmented?

( ) tape worm
( ) earthworm
( ) centipede
( ) crayfish
(+) shark

Solution

metamerism is the phenomenon of having a linear series of body segments fundamentally similar in structure, though not all such structures are entirely alike in any single life form because some of them perform special functions. In animals, metameric segments are referred to as somites or metameres. In plants, they are referred to as metamers or, more concretely, phytomers.

Question 45.

The glottis is the opening which leads to the

( ) oesophagus
(+) larynx
( ) nostril
( ) pharynx.
( ) mouth

Solution

The glottis is defined as the opening between the vocal folds (the rima glottidis) that connect to the larynx viewed from behind.

Question 46.

An organism X lives entirely on the waste products in another organism Y. In this association of X is a

( ) symbiont
( ) saprophyte
(+) commensal
( ) parasite
( ) epiphyte

Solution

Commensalism is a relationship between two organisms where one receives a benefit or benefits from the other and the other is not affected by it. In other words, one is benefited and the other is neither benefited nor harmed.

Question 47.

The one-seed fruit in which the pericarp and seed coat have become fused together is known as

( ) achene
( ) samara
( ) legume
( ) caryopsis
(+) drupe

Solution

In botany, a drupe (or stone fruit) is an indehiscent fruit in which an outer fleshy part (exocarp, or skin; and mesocarp, or flesh) surrounds a shell (the pit, stone, or pyrene) of hardened endocarp with a seed (kernel) inside.

Question 48.

The digestive enzyme that coagulate protein in milk is

( ) ptyalin
( ) pepsin
(+) rennin
( ) trysin
( ) amylase

Solution

Rennin or Chymosin is a protease found in rennet. It is an aspartic endopeptidase belongs to MEROPS A1 family. It is produced by newborn ruminant animals in the lining of the fourth stomach to curdle the milk they ingest, allowing a longer residence in the bowels and better absorption.

Question 49.

In mucor or rhizopus carbohydrate is absorbed in the form of

( ) starch
( ) sucrose
( ) glycogen
( ) arabinose
(+) glucose

Solution

The answer is "glucose"

2011

Question 1.

If $52_n - 24_n = 25_n$ then n is

( ) 4
(+) 7
( ) 11
( ) 5
( ) 2

Solution

$$52_n - 24_n = 25_n$$
$$\left[5\times n^1 + 2\times n^0\right] - \left[2\times n^1 + 4\times n^0\right] = 2\times n^1 + 5\times n^0$$
$$5n + 2 - (2n+4) = 2n+5$$
$$5n + 2 - 2n - 4 - 2n = 5$$
$$\therefore n = 5 + 2 = 7$$

Question 2.

The value of n that satisfies

$$\frac{8^{n+2} - 6\left(2^{n+1}\right)^3}{2^n x 4^{n+2}}$$

(+) 1
( ) 1/2
( ) 1/4
( ) 2
( ) 4

Solution

$$\frac{8^{n+2} - 6\left(2^{n+1}\right)^3}{2^n \times 4^{n+2}} = \frac{8^n \times 8^2 - 6\left(2^{3n} \times 2^3\right)}{2^n \times 2^{2n+4}}$$
$$= \frac{2^{3n} \times 2^6 - 6\left(2^{3n} \times 2^3\right)}{2^{3n} \times 2^4} = \frac{2^{3n}\left(2^6 - 48\right)}{2^{3n}\left(2^4\right)} = 1$$

Question 3.

Find x if $(2.5)^{x-3} = (0.4)^{6+x}$

( ) 1.5
( ) 2.5
(+) -1.5
( ) -2.5
( ) 2

Solution

$$(2.5)^{x-3} = (0.4)^{6+x}$$
$$\left(\tfrac{5}{2}\right)^{x-3} = \left(\tfrac{2}{5}\right)^{6+x}$$
$$\left(\tfrac{2}{5}\right)^{-x+3} = \left(\tfrac{2}{5}\right)^{6+x}$$
$$\therefore -x + 3 = 6 + x;$$
$$2x = 3 - 6 = -3$$
$$\therefore x = -\tfrac{3}{2} = -1.5$$

Question 4.

Solve the following equation

$$\sqrt{(x+6)} = 1 + \sqrt{(x+1)}$$

(+) 3
( ) 4
( ) 5
( ) 2
( ) 1

Solution

$$\sqrt{(x+6)} = 1 + \sqrt{(x+1)}$$
$$\left(\sqrt{x+6}\right)^2 = \left(1 + \sqrt{x+1}\right)^2$$
$$x + 6 = 1 + 2\sqrt{x+1} + x + 1$$
$$x + 6 = 2 + x + 2\sqrt{x+1}$$
$$2\sqrt{x+1} = 4; \sqrt{x+1} = 2$$
$$x + 1 = 2^2 = 4$$
$$\therefore x = 4 - 1 = 3$$

Question 5.

The remainder when x + 3 divides

$$2x^3 - 11x^2 + 8x$$

( ) -871
( ) -781
( ) -187
(+) -178
( ) 0

Solution

$$x + 3 = 0; x = -3$$
$$2(-3)^3 - 11(-3)^2 + 8(-3) - 1$$
$$= -54 - 99 - 24 - 1 = -178$$

Question 6.

If A is set of even numbers between 1 and 10 inclusive, find the power set of A, P(A).

( ) 5
(+) 32

( ) 16
( ) 64
( ) 128

Solution

$$power_of_a_set = 2^n$$

$$n = number_of_even_numbers$$

$$p(A) = 2^5 = 32$$

Question 7.

If $3(2^x) = 24$, then x is

( ) 2
( ) 4
( ) 8
(+) 3
( ) 1

Solution

$$3(2^x) = 24;$$

$$2^x = 24/3 = 8 = 2^3$$

Question 8.

Simplify $\cos^2 x(\sec^2 x - \tan^2 x)$

( ) 2
( ) 4
( ) -1
(+) 1
( ) 5

Solution

The answer is 1

Question 9.

What is the value of n if $5x^n p_n = 24x^n C_4$

( ) 4
( ) 6
(+) 8
( ) 2
( ) NONE

Solution

$$5 \times \frac{n \times (n-1) \times (n-2) \times (n-3)!}{(n-3)!}$$

$$= 24 \times \frac{n \times (n-1)(n-2)(n-3)(n-4)!}{(n-4)! \times 24}$$

$$5[n(n-1)(n-2)] = n(n-1)(n-2)(n-3)$$

$$5 = n - 3$$

$$\therefore n = 5 + 3 = 8$$

Question 10.

The remainder when x + 3x - 5x + 7x - x is divided by x - 1 is

(+) 5
( ) 0
( ) 1
( ) 3
( ) 17

Solution

$$x - 1 = 0; x = 1$$

$$x + 3x - 5x + 7x - x = 1 + 3(1) - 5(1) + 7(1) - 1 = 5$$

Question 11.

Three quarters of Physics class .....dramatically.

( ) improve
( ) improves
(+) are improving
( ) Is improving
( ) have improve

Question 12.

The university has large collection of sporting.....

(+) equipment
( ) equipments
( ) costumes
( ) aids
( ) facility

Question 13.

There are..... on the spelling and pronunciation at the end of the book.

(+) appendixes
( ) appendix
( ) appendixes'
( ) appendices'

Question 14.

A range of options .....available to the political parties during the recent concluded elections.

(+) were made
( ) is made
( ) are made
( ) is make
( ) was made

Question 15.

Either Ada or you..... to go.

( ) was
(+) are
( ) has
( ) is
( ) had

Question 16.

A very popular ruler is at the.....

( ) helms of affair
( ) helm of affair
( ) realm of affair
(+) helm of affairs
( ) helms of affairs

Question 17.

I hardly..... down to sleep when I heard the gunshot.

( ) lay
( ) lied
(+) lain
( ) laid
( ) lie

Question 18.

I have already..... it on the sitting room wall.

( ) hanged
( ) hunged
( ) hang
(+) hung
( ) hanging

Question 19.

The visitor was very uncomfortable because of his..... nose

(+) runny
( ) running
( ) watery
( ) flowing
( ) run

Question 20.

The members of the other team agreed .....all the terms of the contract.

( ) by
( ) to
(+) on
( ) of
( ) with

Question 21.

The cilia in paramecium are used for

( ) respirating
(+) locomotion
( ) protection
( ) regulating food-in take
( ) excretion

Solution

Paramecium is a ciliate protozoan. Ciliates' bodies are covered with fine cytoplasmic hair-like structures called cilia, it is used for locomotion.

Question 22.

Which of these is not associated with the movement of toad, reptile or bird?

( ) hopping
(+) bopping
( ) flapping
( ) gliding
( ) Pecking

Question 23.

The region of cell division in a root is

( ) root cap
( ) endodermis
( ) xylem
( ) piliferous layer
(+) meristem

Solution

Zone of cell division. An apical meristem lies under and behind the root cap and, like the stem apical meristem, it produces the cells that give rise to the primary body of the plant. Unlike the stem meristem, it is not at the very tip of the root; it lies behind the root cap. it is the region of cell division.

Question 24.

Which of the following insects has an incomplete metamorphosis during life cycle?

( ) grasshopper
( ) bee
( ) mosquito
(+) housefly
( ) butterfly

Solution

Insects that go through three stages in their life cycle have an incomplete metamorphosis. Insects that have an incomplete metamorphosis life cycle include true bugs, grasshoppers, cockroaches, termites, praying mantises, crickets, and lice.

Question 25.

The deficiency of vitamin D leads to

( ) scurvy
( ) pellagra
(+) rickets
( ) beriberi
( ) polio

Solution

Softening of the bones, resulting from impaired mineralization, with excess accumulation of osteoid, caused by a vitamin D deficiency in adults. A similar condition in children is called rickets. The deficiency may be due to lack of exposure to ultraviolet rays, inadequate intake of vitamin D in the diet, or failure to absorb or utilize vitamin D.

Question 26.

Exoskeleton is not found in the

( ) maggot
( ) mosquito larva
(+) earthworm
( ) caterpillar
( ) termite

Question 27.

How many nuclei are found in a pollen tube during fertilization

( ) 2
(+) 3
( ) 5
( ) 6
( ) 7

Question 28.

A group of similar cells performing the same function is

( ) an organ
( ) a system
(+) a tissue
( ) an organelle
( ) an enzyme

Solution

Tissue a group of biological cells that perform a similar way to function

Question 29.

One disease not caused directly by bacteria is

( ) leprosy
( ) tuberculosis
(+) pneumonia
( ) tetanus
( ) cholera

Solution

Pneumonia is either caused by bacteria or Virus.

Question 30.

Which vertebra has a projection called odontoid process?

( ) atlas
( ) thoraic
( ) lumber
(+) axis
( ) caudal

Solution

The dens, also odontoid process or peg, is the most pronounced feature, and exhibits a slight constriction or neck where it joins the main body of the vertebra. The dens is a protuberance (process or projection) of the axis (second cervical vertebra).

Question 31.

How many grams of hydrogen gas will be liberated when 6g of magnesium ribbon dissolves in 500cm3 of 6M HCl? (Mg =24, H =1, Cl =35.5)

(+) 0.2g
( ) 0.07g
( ) 0.5g
( ) 0.3g
( ) 0.12g

Solution

Equation of reaction: $Mg + 2HCl \rightarrow MgCl_2 + H_2$

24g of Mg liberated 2g of H2
6g og Mg liberate Xg of H2 [cross multiplying]

$$Xg = \frac{6 \times 2}{24} = 0.2g_of_Mg$$

Question 32.

The ratio of the number of molecules in 2g of hydrogen is

( ) 2: 1
(+) 1:1
( ) 1:2
( ) 1:4
( ) 1:6

Solution

Using: number of moles= $given mass / molar mass$

$$Ratio = 1:1$$

Refer to Page 30 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 33.

The minimum volume of hydrogen required for the complete combustion of a mixture of 10cm3 of a CO and 15cm3 of H2 is

(+) 25.0cm3
( ) 12.5cm3
( ) 10.0cm3
( ) 5.0cm3
( ) 10.5cm3

Solution

The answer is "25.0cm3 "

Question 34.

An element X1 forms a volatile hydride XH3 with a vapour density of 17.0. The relative atomic mass of X is

( ) 34.0
(+) 31.0
( ) 20.0
( ) 14.0
( ) 30.0

Solution

$$Molarmass = 2 \times V.D$$
$$x + 3 = 2(17) = 34;$$
$$x = 34 - 3 = 31$$

Refer to Page 89 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 35.

The PH of a solution obtained by mixing 100cm3 of 0.1M HCL solution with 100cm3 of 0.2M solution of NaOH is

( ) 1.3
(+) 7.0
( ) 9.7
( ) 12.7
( ) 10.

Solution

The answer is "7.0 "

Question 36.

How many moles of limestone will be required to produce 5.6g of Cao?

( ) 0.20mol
(+) 0.10mol
( ) 1.12mol
( ) 0.56mol
( ) 0.30mol

Solution

Equation of reaction: $CaCO_3 \rightarrow CaO + CO_2$

(40+12+48)g of CaCO3 forms (40+16)g of CaO
Xg of CaCO3 will form 5.6g of CaO

$$Xg = \frac{100 \times 5.6}{56} = 10g$$

Number of moles of CaCO3=given mass/molar mass=10/100=0.1moles

Question 37.

If 30cm3 of a gas at 50°C is warmed to 80°C at a fixed pressure, the fractional increase in volume is

( ) 0.009
( ) 0.093
(+) 0.910
( ) 1.090
( ) 0.193

Solution

$V_1 = 30cm^3, T_1 = 50^0c = 50+273k, T_2 = 80^0c = 80+273 = 353k, V_2 = ?$

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

$$\frac{30}{323} = \frac{V_2}{323} = 32cm^3$$

$$\therefore Fractional_increase = \frac{V_1}{V_2} = \frac{30}{32} = 0.91$$

Question 38.

What is the volume of oxygen required to burn completely 45cm3 of methane at S.T.P?

( ) 135.0cm3
( ) 180.0cm3
( ) 45cm3
( ) 190.0cm3
(+) 90.0cm3

Solution

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

1 Vol of CH4 requires 2 vol of O2
45cm3 of CH4 will require 90cm3 of O2

Question 39.

What is the PH of 0.001 mol dm·3 solution of sodium hydroxide?

( ) 14
( ) 13
( ) 12
(+) 11
( ) 10

Solution

$$P^{OH} = \log\left(\frac{1}{OH^-}\right) = \log\left(\frac{1}{0.001}\right) = \log 1000 = 3$$

$$P^H + P^{OH} = 14$$

$$P^H = 14 - P^{OH} = 14 - 3 = 11$$

Question 40.

The number of isomer that can be obtained from C4H10 is

( ) 3
( ) 4
( ) 1
( ) 5
(+) 2

Solution

The answer is "2"

Question 41.

A body start from rest and moves with uniform acceleration of 6ms·2. What distance does it cover in the third second?

( ) 30m
(+) 27m
( ) 18m
( ) 15m
( ) 2m

Solution

Given U=0 A=6ms-2 s=? t=3s
applying equation of motion

$$S = ut + \frac{1}{2}at^2$$

$$S = (0 \times 3) + \frac{1}{2} \times 6 \times (3^2)$$

$$s = 3 \times 9 = 27m$$

Refer to Page 125 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 42.

An object is projected with a velocity of 80ms·1 at an angle of 30 to the horizontal. The maximum height reached is

( ) 20m
(+) 81.63m
( ) 160m
( ) 320m
( ) 240m

Solution

V=80ms-1 angle=30 Hmax=?

$$H\max = \frac{u^2 \sin^2\theta}{29} = \frac{80^2 \sin^2 30}{2(9.8)}$$

$$= \frac{1600}{19} = 81.63m$$

Refer to Page 135 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 43.

A beam of light is incident from air at an angle of 30°. Find the angle of refraction if the refractive index in water is 4/3

( ) 0.15°
(+) 22.02°
( ) 41.81°
( ) 0.67°
( ) 0.38°

Solution

$$_a\eta_g = \frac{Sine_of_angle_of_incidence_in_air}{Sine_of_angle_of_refraction_in_water}$$

$$\frac{4}{3} = \frac{\sin 30}{\sin r_w}$$

$$\sin r_w = \frac{\sin 30 \times 3}{4} = 0.375$$

$$r_w = \sin^{-1}(0.375)$$

$$r_w = 22.02^0$$

Refer to Page 291 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 44.

A concave lens of focal length 20cm forms an image 1/2 the size of the object. The object distance is

( ) 100cm
( ) 100/9cm
( ) 60/7cm
( ) 10cm
(+) 60cm

Solution

$$u \sin g \frac{1}{u} + \frac{1}{v} = \frac{1}{f}$$

$$\frac{1}{u} + \frac{1}{0.5u} = \frac{1}{20}$$

$$\frac{0.5+1}{0.5u} = \frac{1}{20}$$

$$\frac{1.5}{0.5u} = \frac{1}{20}$$

$$0.5u = 30$$

$$\therefore u = \frac{30}{0.5} = 60cm$$

Refer to Page 286 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 45.

A wire of length 15m made of a material of resistivity $1.8\times10^{-6}\Omega\text{-m}$ has a resistance of 0.27Ω area of the wire is

( ) $1.5x10^{-4}m^2$
(+) $1.0x10^{-4}m^2$
( ) $2.7x10^{-5}m^2$
( ) $7.3x10^{-5}m^2$
( ) $1.5x10^{-5}m^2$

Solution

$$p = 1.8\times10^{-6}\Omega - m, R = 0.27\Omega, A = ?, L = 15m$$

$$P = \frac{R\times A}{L}$$

$$L = \frac{R\times A}{P}$$

$$A = \frac{15\times1.8\times10^{-6}}{0.27} = \frac{2.7\times10^{-5}}{0.27} = 1\times10^{-4}m^2$$

Refer to Page 397 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 46.

The power dissipated in an A.C circuit with an r.m.s. current of 5A, r.m.s voltage of 10V and a phase angle of 60° is

(+) 25W
( ) 50W
( ) 120W
( ) 125W
( ) 2W

Solution

Power in an AC-Circuit is given by

$$P = IV\cos\phi$$

$$P = 5\times10\cos60^0 = 50\times0.5$$

$$25w$$

Refer to Page 460 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 47.

A cell supply current of 0.04A and 0.2A through a 4.0 and 10 resistors respectively. The internal resistance of the cell is

(+) 2.0Ω
( ) 1.0Ω
( ) 2.5Ω
( ) 1.5Ω
( ) 0.5Ω

Solution

$$Ia = 0.4A_through_4.0\Omega(R_1)$$
$$Ib = 0.2A_through_10.0\Omega(R_2)$$
$$Using_Ia(R_1 + r) = Ib(R_2 + r)$$
$$0.4(4 + r) = 0.2(10 + r)$$
$$0.4r - 0.2r = 2 - 1.6 = 0.4$$
$$R = 0.4/0.2 = 2\Omega$$

Question 48.

If the decay constant of a radioactive substance is 0.231s-1 . the half is

( ) 1.50s
( ) 0.33s
( ) 0.12s
(+) 3.00s
( ) 2.31s

Solution

Decay constant=0.231s-1

$$t_{1/2} = 0.693/k,$$

$$t_{1/2} = 0.693/0.231 = 3s$$

Refer to Page 473 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 49.

What is the number of neutrons in the uranium isotope,

( ) 92
(+) 146
( ) 238
( ) 330
( ) 119

Solution

Number of protons=Number of electrons=92
Mass Number=Number oCVf neutrons+92
Number of neutrons=238-92=146

2010

Question 1.

Without..... words he accused him directly of treachery.

( ) amending
( ) modifying
( ) mixing
(+) mincing
( ) minimizing

Solution

Question 2.

They tried to cash in .....the people ignorance

( ) under
( ) on
(+) against
( ) with
( ) at

Question 3.

Always remember to..... the lights before leaving the room

( ) put on
( ) put off
(+) switch off
( ) blow out
( ) remove

Question 4.

I am disappointed ... the ways you conducted yourse... t... e party.

( ) by
( ) for
( ) due
( ) in
(+) at

Question 5.

The proprietors should be blamed for such a deplorable condition in the nursery schools.....

( ) isn't it
(+) shouldn't they
( ) should they
( ) is it
( ) wouldn't they

Question 6.

... you mind.....another minute or two?

( ) to wait
( ) wait
(+) waiting
( ) being waited
( ) waits

Question 7.

It had been raining before the match started .....

( ) isn't it
( ) hasn't it
(+) hadn't it
( ) wasn't it
( ) haven't it

Question 8.

Mary goes to school.....bus

( ) in
( ) on
( ) with
( ) of
(+) by

Question 9.

The plane overshot the.....in a minor accident

( ) read
( ) hanger
(+) runway
( ) tarmac
( ) railway

Question 10.

Journalists always collect and publish.....

(+) information
( ) informations
( ) an information
( ) much information
( ) every information

Question 11.

A micrometer is defined as one millionth of a millimeter. A length of 12,000 micrometer may be represented as?

( ) 0.00012M
( ) 0.0000012M
(+) 0.000012M
( ) 0.00000012M
( ) 0.000000012M

Solution

$$1_division \rightarrow 0.00000\,1mm$$

$$\therefore 12000\times10^{-3}\,mm \rightarrow xmm_[cross_multiplying]$$

$$xmm = 0.000001\pm\times12000\times10^{-3} = 0.000012M$$

Question 12.

Factorize $3x^3+4x^2-13x+6$ completely, given that x - 1 is a factor.

( ) (x - 1)(x - 3)(x + 2)
( ) (x - 1)(x +3)(x -2)
( ) (x - 1)(x +3)(3x -2)
(+) (x - 1)(x + 3)(3x - 2)
( ) (x + 1)(x - 3)(x + 2)

Solution

$$\begin{array}{r} 3x^2+7x-6 \\ x-1\overline{)3x^3+4x^2-13x+6} \\ 3x^3-3x^2 \\ 7x^2-13x+6 \\ 7x^2-7x \\ -6x+6 \\ -6x+6 \\ \hline \end{array}$$

$$(x-1)(3x^2+7x-6)=(x-1)(3x-2)(x+3)$$

Question 13.

Find all real numbers x which satisfies the inequality 1/3(X + 1) 1 > 1/5(X + 4).

( ) x < 11
( ) x < -1
( ) x >6
(+) x > 11
( ) x >-6

Solution

$$\tfrac{1}{3}(x+1)-1 > \tfrac{1}{5}(x+4)$$

$$\frac{x-2}{3} > \frac{x+4}{5}[cross_multiplying]$$

$$5x-10 > 3x+12;$$

$$5x-3x > 12+10$$

$$2x > 22$$

$$\therefore x > 11$$

Question 14.

7 pupils of average age 12 years leave a class of 25 pupil's average age 14years. If 6 new pupils of average age 11 years join the class, what is the average age of the pupils now in the class?

( ) 13 years
( ) 12 years 7.5 months
( ) 13 years 5 months
(+) 13 years 10 months
( ) 13 years 7.5 months

Solution

For 7 pupils [that left the class]
Total age=7x12=84years
For 25 pupils,
Total age=25x14=350years
For 6 new pupils [that entered the class]
Total age=6x11=66years
Number of pupils remaining=25+6-7=24pounds
Total age of pupil remaining=350+66-84=332years
Average age of pupils remaining=332/24=13years 10months

Question 15.

Given a regular hexagon, calculate each interior angle of the hexagon

( ) 60
(+) 120
( ) 45
( ) 135
( ) 140

Solution

$$\frac{(2n-4)90}{N} = \frac{[2(6)-4]90}{6} = \frac{8\times90}{60} = 120^0$$

Question 16.

Without using tables solve the equation:

$$8x^{-2} = \tfrac{2}{5}$$

(+) 4.4
( ) 6.3
( ) 8.1
( ) 10
( ) 12

Solution

$$8x^{-2} = \tfrac{2}{5}$$

$$x^{-2} = \tfrac{2}{5}\times\tfrac{1}{8} = \tfrac{1}{20}$$

$$\tfrac{1}{x^2} = \tfrac{1}{20}$$

$$x^2 = 20$$

$$\therefore x = \sqrt{20} = 4.4$$

Question 17.

A student measures a piece of rope and found that it was 1.26m long. If the actual length of the rope is 1.25m, what was the percentage error in the measurement?

( ) 0.40%
( ) 0.01 %
( ) 0.25%
( ) 0.89%
(+) 0.80%

Solution

$$Percentage_error = \frac{error}{Actual_Length} \times 100\%$$

$$= \frac{1.26 - 1.25}{1.25} \times 100 = 0.80\%$$

Question 18.

Express the product of 0.21 and 0.34 in standard form

( ) 7.14×10^{-3}
( ) 7.14×10^{-1}
(+) 7.14×10^{-2}
( ) 7.14×10^{-4}
( ) 7.14×10^{-5}

Solution

$$0.21 \times 0.34 = 2.1 \times 10^{-1} \times 3.4 \times 10^{-1} = 7.14 \times 10^{-2}$$

Question 19.

If 5, 8, 6 and 2 occur with frequencies 3, 2, 4 and 1 respectively, find the product of the modal and median number

( ) 36
( ) 48
( ) 30
( ) 40
(+) None of the above

Solution

X	5	8	6	2
F	3	2	4	1
Fx	15	16	24	2

$$Mean = \frac{\sum Fx}{\sum F} = \frac{57}{10} = 5.7$$

$$Mode = 6 | because_it_has_the_highest_frequency_at_4 |$$

$$Product: mean \times mode = 5.7 \times 6 = 34.2$$

Question 20.

A plant which grows on another plant without apparent harm to the host plant is called

( ) a parasite
(+) an epiphyte
( ) a saprophyte
( ) a predator
( ) a hermaphrodite

Solution

An epiphyte is a plant that grows harmlessly upon another plant and derives its moisture and nutrients from the air, rain, and sometimes from debris accumulating around it.

Question 21.

Which of these types of skeleton is most appropriate to the cockroach?

( ) hydrostatic skeleton
(+) exoskeleton
( ) endoskeleton
( ) cartilaginous skeleton
( ) bony skeleton

Solution

An exoskeleton is the external skeleton that supports and protects an animal's body, in contrast to the internal skeleton (endoskeleton) of, for example, a human. In usage, some of the larger kinds of exoskeletons are known as "shells". Examples of exoskeleton animals include insects such as grasshoppers and cockroaches, and crustaceans such as crabs and lobsters.

Question 22.

Which of these is not true of the insect? The possession of

(+) two pairs of antennae
( ) jointed appendages

( ) exoskeleton
( ) three pairs of legs
( ) segmented body

Solution

The answer is "two pairs of antennae"

Question 23.

All living things

( ) photosynthesis
( ) respire
( ) move
( ) transpire
(+) feed

Solution

The answer is "feed"

Question 24.

A secchi disc is used in the determination of

( ) rainfall
( ) tides
( ) waves
(+) turbidity
( ) current velocity

Solution

The answer is "Turbidty"

Question 25.

Which of the following is not an excretory product?

( ) urine
( ) sweat
(+) feaces
( ) Salts
( ) carbon dioxide

Answer

The answer is "feaces "

Question 26.

Which of the following organs produce bile?

( ) gall bladder
( ) pancreas
( ) spleen
(+) liver
( ) stomach

Solution

It is an accessory digestive gland and produces bile, an alkaline compound which aids in digestion via the emulsification of lipids. The gallbladder, a small pouch that sits just under the liver, stores bile produced by the liver.

Question 27.

Which of the following food substances is digested in the stomach?

( ) carbohydrates
( ) fats and oil
(+) fats and proteins
( ) proteins
( ) carbohydrates and fats

Solution

The answer is "fats and proteins "

Question 28.

For pollination and fruit formation, the essential part(s) of the flower should be the

( ) corolla
( ) ovary
(+) pistil (gynoecium's)
( ) ovules
( ) receptacle

Solution

Pistil, the female reproductive part of a flower.

Question 29.

Which part of the human brain is concerned with reflexes controlling the rate of heart beat and breathing?

(+) medulla
( ) cerebrum
( ) cerebellum
( ) pineal body
( ) olfactory lobe

Solution

The answer is "surface tension"

Question 30.

Which of the following is not a consequence of a force field?

( ) weight
(+) surface tension
( ) gravitational pull
( ) magnetic force
( ) electric force

Solution

The answer is surface tension

Question 31.

Which of the following is used to determine the relative density of the acid in a car battery?

( ) hypsometer
( ) hygrometer

( ) manometer
(+) hydrometer.
( ) nanometer

Solution

The answer is "hydrometer"

Question 32.

The motion of the prongs of sounding tuning fork is?

( ) random
( ) translational
( ) rotational
(+) vibratory
( ) vibratory and rotational

Solution

The answer is "vibratory"

Question 33.

An avocado fruit drops from the top of a tree 45m tall. How long does it take to reach the ground?

(+) 3.0s
( ) 4.5s
( ) 6.0s
( ) 8.6s
( ) 9.0s

Solution

$$S = ut + \frac{1}{2}gt^2$$

$$where_u = 0$$

$$45 = \frac{1}{2} \times 9.8 \times t^2$$

$$t^2 = \frac{90}{9.8} = 9$$

$$\therefore t = \sqrt{9} = 3s$$

Refer to Page 125 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 34.

Which of the following is a scalar quantity?

( ) momentum
( ) Acceleration
( ) displacement
(+) Distance
( ) force

Solution

Scalar quantity are quantities that has magnitude but no direction

Question 35.

A ball bearing is gently released from rest and allowed to fall through a viscous fluid. Which of the following statements about the motion is correct?

( ) its acceleration decreases before terminal velocity is attained
( ) when terminal velocity is attained the acceleration of the fluid becomes zero
(+) its velocity increases before terminal velocity is attained
( ) there is no resultant force on the ball before it attains terminal velocity

Question 36.

When the vapour of a substance is in equilibrium with its own liquid, it is said to be

( ) gaseous
( ) unsaturated
(+) saturated
( ) diffused
( ) liquefied

Solution

The answer is "saturated "

Question 37.

A man standing between two parallel mirrors in a barbers shop will see the following number of his own image

( ) eight
( ) two
( ) four
( ) one
(+) infinite

Solution

$$n = \frac{360}{0} = \infty$$

Refer to Page 278 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 38.

If the wave length of a wave traveling with a velocity of 360m/s is 60cm, the period of the wave is

( ) 6s
( ) 3.5s
( ) 0.17s
( ) 0.61 s

(+) None of the Above

Solution

$$v = 360m/s, \lambda = 60cm = 0.6m$$

$$v = f\lambda$$

$$f = v/\lambda = 360/0.6 = 600Hz$$

$$Period, T = 1/f = 1/600 = 0.0016s$$

Question 39.

12Ocm3 of hydrogen were sparked with 60cm3 of oxygen at 110°c. What was the volume of steam produced? The equation for the reaction is: $2H_{2(g)} + O_{2(g)} \rightarrow 2H_{2(g)}$

( ) 30cm

( ) 60cm

( ) 90cm

(+) 120cm

( ) 150cm

Solution

The answer is 120cm

Question 40.

Catalytic hydrogenation of oils results in the production of

( ) soaps

( ) detergents

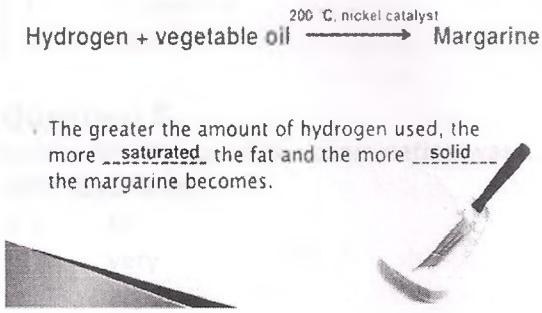
( ) alkanes

(+) margarine

( ) butter

Solution

Catalytic hydrogenation of Margarine



Question 41.

Which of the following compounds will undergo additional reaction?

(+) ethyne

( ) butane

( ) pentane

( ) ethanol

( ) tetrachloromethane

Solution

An addition reaction, in organic chemistry, is in its simplest terms an organic reaction where two or more molecules combine to form a larger one (the adduct). All double bond and Tripple bond hydrocarbons undergo addition reaction

Question 42.

The products of the electrolysis of dilute sodium chloride solution with platinum electrodes are

(+) hydrogen and chlorine

( ) oxygen and chlorine

( ) chlorine and water

( ) sodium amalgam and chlorine

( ) sodium hydroxide and water

Question 43.

When starch undergoes complete enzyme-catalysed hydrolysis, the resulting product is

(+) glucose

( ) maltose

( ) sucrose

( ) fructose

( ) cellulose

Question 44.

Compounds that have the same molecular formular but different structures are said to be

( ) allotropic

( ) polymorphic

( ) polymeric

(+) isomeric

( ) isotropic

Solution

In organic chemistry, an isomer (from Greek isos = "equal", méros = "part") is a molecule with the same molecular formula as another molecule, but with a different chemical structure.

Question 45.

The maximum number of electrons that can be accommodated in the shell having the principal quantum number 3 is

( ) 3

( ) 9

( ) 10
(+) 18
( ) 32

Solution

Number or Electrons=
Where n=principal quantum number

$$2n^2 = 2(3)^2 = 18$$

Refer to Page 51 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 46.

The following acids are non-basic except

( ) methanoic acid
( ) dioxinotrate (iii) acid
(+) ethanedoic
( ) oxochlorate I acid
( ) hydrobromic acid

Solution

The answer is ethanedoic"

Refer to Page 548 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013.

Question 47.

What is the quantity of electricity produced when a current of 0.5A is passed for 5 hours 45 mins? (1F = 96500C).

( ) 0.11 F
( ) 0.12F
(+) 0.22F
( ) 1.1F
( ) 2.2F

Solution

Study about Faraday Under Electricity

$$Q = It = (0.5 \times 5 \times 60 \times 60) + (45 \times 60)$$

$$= 18000 + 2700 = 20700$$

$$1F \rightarrow 96500C$$

$$\therefore xF \rightarrow 20700$$

$$xF = \frac{20700C \times 1F}{96500C} = 0.22F$$

Refer to Page 209 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 48.

Which of the following pH values is likely to be that close slightly alkaline system?

( ) 2
( ) 5
( ) 7
(+) 8
( ) 13

Solution

The answer is "8"

Refer to Page 103 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

2009

Question 1.

Ifeyinwa found that thieves had entered her house in her absence. She went to the police to report the .....

( ) breakout
( ) breakup
(+) break in
( ) breakthrough
( ) breaking

Question 2.

Gone are the days when he.....enjoy patronage

( ) would
( ) will
( ) could
(+) used to
( ) can

Question 3.

All..... well with Peter.

( ) are not
( ) have not been
( ) were not
(+) is not
( ) aren't

Question 4.

The villagers looked.....their leader for good examples.

(+) up to
( ) on to
( ) up at
( ) forward to
( ) into

Question 5.

Emeka failed because the examination was..... difficult for him.

( ) so
( ) very
( ) highly
(+) too
( ) much

Question 6.

The dancers were all in..... before their departure.

( ) good spirits
(+) good spirit
( ) high spirit
( ) high spirits
( ) high spirit

Question 7.

The suspect defrauded his ... victim of large sums of money.

( ) unsuspected
( ) unsuspecting
(+) unexpected
( ) unexpecting
( ) suspecting

Question 8.

The judge acquitted the accused.....all the eight counts.

(+) of
( ) in
( ) from
( ) upon
( ) on

Question 9.

My uncle is one of the..... of society

( ) elitists
(+) elites
( ) elite
( ) elitist.

Question 10.

..... all probability, the train will arrive today.

( ) in
(+) under
( ) for
( ) by
( ) upon

Question 11.

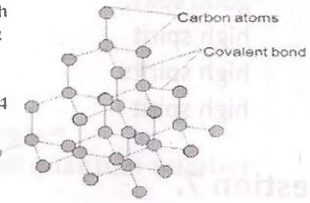
Which of the following solids has a network structure?

(+) diamond
( ) iodine
( ) sulphur
( ) graphite
( ) butter

Solution

Diamond

- Diamond has a giant covalent structure with of a network of strong covalent bonds.
- Each carbon atom is covalently bonded to 4 other carbon atoms.
- Similar for silicon.



Refer to Page 122 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 12.

The following gases decolourize bromine water except.

(+) C_2H_6

( ) C_2H_4

( ) C_2H_2

( ) C_3H_4

( ) C_4H_6

Solution

Bromine water is decolourized by unsaturated hydrocarbons

Refer to Page 534 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 13.

The alloy used for metal work and plumbing contains.

(+) lead and tin

( ) iron and carbon

( ) copper and tin

( ) aluminium and copper

( ) aluminum and iron

Solution

The answer is "Lead and tin"

The thing about tin-lead alloys used for plumbing, rather than electronics, is that they tend not to be eutectic (63/37) mixtures. They were usually 50/50 or 40/60 alloys.

Question 14.

The components of universal indicator solution can best be separated by

(+) chromatography

( ) filtration

( ) evapouration

( ) fractional distillation

( ) transpiration

Solution

Chromatography is a method by which a mixture is separated by distributing its components between two phases. The stationary phase remains fixed in place while the mobile phase carries the components of the mixture through the medium being used.

Refer to Page 17-18 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 15.

The oxidation numbers of phosphorous in

( ) +1

( ) +2

( ) +3

(+) +5

( ) +7

Solution

$$PO_4^{3-} = P + (4 \times -2) = -3$$

$$P - 8 = -3$$

$$\therefore P = -3 + 8 = 5$$

Refer to Page 191 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013.

Question 16.

Water can be obtained as the only product during

( ) combustion of hydrocarbons

( ) neutralization of an acid by a base

(+) combustion of hydrogen

( ) electrolysis of brine

( ) boiling water

Solution

The combustion of hydrogen with oxygen produces water as its only product: 2H2 + O2 → 2H2O. In contrast, combustion of high temperature combustion fuels, such as kerosene, gasoline, or natural gas, with air can produce oxides of nitrogen, known as NOx emissions.

Refer to Page 348 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 17.

The oxidation of ammonia in excess air produces

( ) N_2O_2

( ) N_2O

( ) NO_2

( ) N_2O_4

(+) NO

Solution

The answer is NO

Question 18.

The gasification of coke is used for the manufacture of

(+) producer gas

( ) natural gas

( ) synthetic gas

( ) industrial gas

( ) artificial gas

Solution

In the United Kingdom, producer gas, also called suction gas, specifically means a fuel gas made from coke, anthracite or other carbonaceous material. Air is passed over the red-hot carbonaceous fuel and carbon monoxide is produced.

Refer to Page 132 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 19.

The solubility curve shows the variation of solute concentration with

( ) volume

(+) temperature

( ) vapour

( ) pressure

( ) weight

Solution

Refer to Page 309 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 20.

The density of a certain gas is 1.98g1dm3 at s.t.p. what is the molecular mass of the gas? (Molar volume of gas at s.t.p. = 22.4dm3)

( ) 44.0g

( ) 54.0g

(+) 26.0g

( ) 31.0g

( ) 39.0g

Solution

$$Density, p = m/v$$

$$m = pv = 1.98 \times 22.4 = 44.3g$$

Question 21.

Simplify: Log6 + log2 - log12.

( ) -4

( ) -1

(+) 0

( ) 8

( ) 10

Solution

$$Log6 + \log 2 - \log 12 = \left(6 \times 2/12\right) = \log 1 = 0$$

Question 22.

The interior angles of a pentagon are (2x + 5) , (x + 20)°, x°, (3x - 20)° and (x + 15)°. Find the value of x.

( ) 80°

( ) 70°

(+) 65°

( ) 40°

( ) None of the above

Solution

Sum of interior angles=2x+5+x+20+x+3x-20+x+15=(n-2)180

8x+20=(5-2)180=540

8x=540-20=520

x=520/8=65

Question 23.

A train travels 60km in M minutes. If its average speed is 400km per hour, find the value of M.

( ) 15

( ) 12

( ) 10

(+) 9

( ) 7

Solution

Distance=60km, time t=m/60hr, speed=400km/hr
From speed=distance/time

$$400 = \frac{60 \times 60}{m}$$

$$m = 3600/400 = 9$$

Refer to Page 15 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 24.

A baker used 40% of a 50kg bag of flour. If 1/8 of the amount used was for cake, how many kilograms of floor were used for cake?

(+) 2.5
( ) 6.25
( ) 155/8
( ) 17.5
( ) 191/3

Solution

$$\frac{40}{100} \times 50 = 20kg$$

$$\frac{1}{8} \times 20 = 2.5kg$$

Question 25.

Find the average of the first four prime numbers greater than 10.

( ) 20
( ) 19
( ) 17
(+) 15
( ) 13

Solution

$$Average = \frac{11+13+17+19}{4} = 15$$

Question 26.

Find the mean deviation of 6, 7, 8,.9, 10.

( ) 1.2
( ) 1.5
( ) 2
(+) 8
( ) 10

Solution

$$Mean = \frac{6+7+8+9+10}{5} = 8$$

Question 27.

The variance of a given distribution is 25, what is the standard deviation?

( ) 125
( ) 75
( ) 25
(+) 5
( ) 3

Solution

$$Standard_Deviation = \sqrt{Variance} = \sqrt{25} = 5$$

Question 28.

Express 7/19 as a percentage, correct to 1 decimal place

( ) 2.7%
( ) 3.7%
( ) 27.1%
(+) 36.8%
( ) 42.2%

Solution

$$\frac{7}{19} \times 100\% = 36.8\%$$

Question 29.

Given that Log4X = -3, find X.

( ) 1/81
(+) 1/64
( ) 64
( ) 881
( ) 102

Solution

$$\log_4^x = -3$$

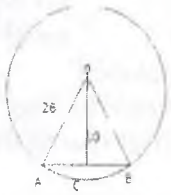
$$x = 4^{-3} = \frac{1}{4^3} = \frac{1}{64}$$

Question 30.

A chord of a circle radius 26cm is 10cm from the center of circle. Calculate the length of the chord.

( ) 16cm
( ) 27.86gcm
( ) 32cm
( ) 40cm
(+) 48cm

Solution



$$|AO|^2 - |OC|^2 = |AC|^2$$

$$26^2 - 10^2 = |AC|^2$$

$$|AC|^2 = 676 - 100 = 576$$

$$|AC| = \sqrt{576} = 24$$

$$Length_of_Chord = 2|AC| = 2 \times 24 = 48cm$$

Question 31.

Which of the following hormones is produced during fright or when agitated.

( ) Insulin
(+) adrenalin

( ) thyroxine
( ) pituitary

Solution

Adrenaline is a hormone released from the adrenal glands and its major action, together with noradrenaline, is to prepare the body for fight or flight.

Question 32.

Which of the following animals is cold blooded?

( ) cat
( ) lizard
(+) whale
( ) Bird
( ) dog

Solution

Cold-blooded creatures take on the temperature of their surroundings. They are hot when their environment is hot and cold when their environment is cold. E.g Whale

Question 33.

Spirogyra reproduces vegetatively by

( ) spore production
(+) fragmentation
( ) multiple fission
( ) binary fission
( ) division

Solution

The vegetative reproduction is fragmentation, i. e., and breakdown of filament into fragments due to mechanical stress or dissolution of septum between the cells.

Question 34.

All the following are digestive enzymes except

(+) bile
( ) lipase
( ) maltase
( ) pepsin
( ) ptyalin

Solution

Bile or gall is a dark green to yellowish brown fluid, produced by the liver of most vertebrates, that aids the digestion of lipids in the small intestine.

Question 35.

If a 26year old man married a one eyed woman and they had four children, how many of them would be blind like their father?

( ) all
( ) 3
( ) 2
( ) 1
(+) None

Solution

The answer is "None"

Question 36.

A tapeworm has no alimentary canal because

( ) it is an antotropic
( ) it does not feed
( ) it has no enzymes
(+) its body absorbs digested food
( ) it is long

Solution

The answer is "its body absorbs digested food "

Question 37.

Where is energy produced in the cell?

( ) nucleus
( ) nucleolus
( ) Lysosomes
(+) Mitochondria

Solution

Mitochondria are a part of eukaryotic cells. The main job of mitochondria is to perform cellular respiration.

Question 38.

Which of the following structure is not found in a female agama lizard?

( ) pre-anal pads
( ) eardrums
( ) Nuchal Crest
( ) gular fold
(+) chloroplast

Solution

The answer is "Chloroplast"

Question 39.

Which of the following disease is NOT caused by a virus

( ) rinderpest
(+) maize rust
( ) Newcastle disease
( ) swine fever
( ) natal scale

Solution

Maize rust is caused by the fungus Puccinia sorghi

Question 40.

Plants which can survive in places where the water supply is limited are

( ) Bryophytes
( ) mesophytes
(+) xerophytes
( ) hyrophytes
( ) pteridophytes

Solution

A xerophyte is a species of plant that has adapted to survive in an environment with little liquid water, such as a desert or an ice- or snow-covered region in the Alps or the Arctic.

Question 41.

Which of the following types of waves cannot travel through a vacuum?

(+) sound waves
( ) light waves
( ) infra-red waves
( ) x-radiation
( ) radio waves

Solution

Sound cannot travel through a vacuum. A vacuum is an area without any air, like space. So sound cannot travel through space because there is no matter for the vibrations to work in.

Question 42.

The temperature at which the water vapour in the air saturates the air and begins to condense is known as

( ) boiling point
( ) melting point
( ) triple point
(+) dew point
( ) critical temperature

Solution

The dew point (dew point temperature or dew point) is the temperature at which dew forms and is a measure of atmospheric moisture. It is the temperature to which air must be cooled at constant pressure and water content to reach saturation.

Question 43.

The motion of the moving skin of a talking drum can rightly be described as

( ) translational
( ) random
( ) rotational
(+) oscillatory
( ) transitory

ANSWER

The answer is "oscillatory "

Question 44.

What is the relative permittivity of a capacitor if its capacitance with a medium as dielectric is 16farads, and its capacitance with vacuum as dielectric is 2farads?

( ) -1
( ) -1/2
( ) 2
( ) 6
(+) 1/8

Solution

$$\varepsilon_r = \frac{C_x}{C_0} \qquad 2/16 = 1/8$$

Question 45.

The activity of a radioactive substance depends on

( ) temperature and purity
( ) temperature and age
(+) age, purity and temperature
( ) purity and age
( ) none of the above

Solution

The answer is "age, purity and temperature "

Question 46.

The principle of the transmissibility of pressure in fluids at rest in all directions is known as

( ) Achimedes principle
( ) Floatation principle
( ) Newton's law
(+) Pascal's law
( ) Boyle's law

Solution

The answer is "Pascal's law "

Question 47.

Change of state is accompanied by change of

( ) temperature
( ) volume
(+) heat content
( ) temperature and volume
( ) volume and heat content

Solution

The answer is "heat content"

Question 48.

The lack of power of accommodation which is mainly due to the hardening of the eye is called

( ) myopia
( ) hypermetropia
(+) presbyopia
( ) eye ring
( ) astigmatism

Solution

presbyopia is a type Long-sightedness caused by loss of elasticity of the lens of the eye, occurring typically in middle and old age.

Refer to Page 319 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 49.

The hatch door of a submarine has an area of 0.5m2. The specific gravity of sea water is 1.03. (Assume that g = 10/s, and neglect the atmospheric pressure). The force exerted by sea water on the hatch door at a depth of 200m is

( ) $1.03\times10^5 N$
(+) $1.03\times10^3 N$
( ) $1.06\times10^5 N$
( ) $2.06\times10^6 N$
( ) $1.03\times10^4 N/m^2$

Solution

$$P = F/A = hpg$$

$$F/0.5 = 200\times1.03\times10$$

$$F = 0.5\times2060 = 1.03\times10^3 N$$

Question 50.

The point beyond which a stretching spring does not return to its original length is called

( ) breaking point
(+) elastic limit
( ) spring constant
( ) elastic point
( ) release point

Solution

This limit, called the elastic limit, is the maximum stress or force per unit area within a solid material that can arise before the onset of permanent deformation. Stresses beyond the elastic limit cause a material to yield or flow.

2008

Question 1.

I have the..... of meeting him.

(+) privilege
( ) privileged
( ) previledge
( ) priviledge

Question 2.

My price for the shoes is fifty naira. I cannot .....anything less than that.

( ) bear with
(+) settle for
( ) agree with
( ) tolerate
( ) settle with

Question 3.

The eldest son took a foolish decision which made him..... his claim to the traditional title

( ) neglect
( ) yield
( ) disclaim
(+) forfeit
( ) neglected

Question 4.

The president's speech.....at 7pm yesterday.

( ) is broadcast
( ) has been broadcast
( ) were broadcast
(+) was broadcast
( ) have been broadcast

Question 5.

The students were advised to look .....difficult words in the dictionary.

( ) in
( ) on
( ) out
( ) into
(+) up

Question 6.

The building.....because of weak structural foundation.

( ) tumbled
( ) succumbed
( ) somersaulted
(+) collapsed
( ) collapse

Question 7.

Since the writer did not indicate his name, the editor decided not to publish such.....article

( ) a discourteous
(+) an anonymous
( ) a cowardly
( ) a libelous
( ) unfriendly

Question 8.

He was charged with complicity ..... the abortive coup.

( ) in
(+) for
( ) about
( ) on
( ) with

Question 9.

..... of what he said made no sense.

( ) much
( ) majority
( ) plenty
(+) many
( ) much

Question 10.

..... things she had in the room were thrown out.

( ) so few
(+) the few
( ) all few
( ) Very few
( ) a few

Question 11.

Pure solvents are obtained by

(+) distillation
( ) condensation
( ) extraction
( ) evaporation
( ) dissolution

Solution

The answer is "distillation "

Question 12.

Environmental pollution is worsened by the release from the automobile exhaust of

( ) water vapour
( ) steam
(+) smoke
( ) heavy metals
( ) steam and smoke

Solution

The answer is "smoke "

Question 13.

Sieving is a technique used to separate mixtures containing solid particles of

( ) small sizes
( ) large sizes
(+) different sizes
( ) the same size
( ) one size

Solution

The answer is "different sizes"

A sieve, or sifter, is a device for separating wanted elements from unwanted material or for characterizing the particle size distribution of a sample, typically using a woven screen such as a mesh or net or metal.

Question 14.

Nitrogen obtained from the liquefication of air has a higher density than that obtained from nitrogen containing compounds because the former contains

( ) water vapour
( ) oxygen
( ) carbon (iv) oxide
(+) rare gases

Solution

The answer is "rare gases"

Refer to Page 405 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 15.

Hydrogen is used in oxy-hydrogen flames for melting metals because it

( ) involves a lot of heat when burnt
(+) combines explosively with oxygen
( ) is a very light gas
( ) is a rocket fuel
( ) it combines with air

Solution

Hydrogen is used in Oxy-hydrogen flames to produce high temperatures (over 2000c) that can melt metals

Refer to Page 349 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 16.

Polyvinyl chloride is used to produce

( ) bread
( ) pencils
(+) pipes
( ) pots
( ) ink

Solution

Polyvinyl Chloride (PVC)

Roughly half of the world's polyvinyl chloride resin manufactured annually is used for producing pipes for municipal and commercial purpose.

Question 17.

The addition of water to calcium oxide leads to

( ) a physical change
(+) a chemical change
( ) the formation of a mixture
( ) an endothermic change

Solution

When water is added drop by drop to the oxide, it cracks with a hissing noise and breaks up into a powdery form accompanied by the liberation of heat. This process is known as slaking, and the end product is calcium hydroxide, Ca(OH)2 which is more commonly known as slaked lime.

Refer to Page 458 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 18.

The metal that will react with water only in the form of steam to liberate hydrogen gas is

( ) calcium
( ) aluminum
(+) iron
( ) zinc
( ) platinum

Solution

When steam is passed over red-hot iron filings, iron(II)diiron(III) oxide and hydrogen are produced. This reaction is reversible.

$$3Fe_{(s)} + 4H_2O_{(g)} \Leftrightarrow Fe_3O_{4(s)} + 4H_{2(g)}$$

Refer to Page 488 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 19.

35cm3 of hydrogen was sparked with 12cm3 of oxygen at 110°c and 760mmHg to produce steam. What percentage of the total volume of gas left after the reaction is hydrogen?

( ) 11%
(+) 31%
( ) 35%
( ) 69%
( ) 80%

Solution

Reaction Equation:

$$2H_2 + O_2 \rightarrow 2H_2O$$

Reacting Volume: 35cm3 12cm3

Expected Volume: 24cm3 12cm3

Excess gas=35-24=11cm3
% of total volume of gas left=11/35 x 100%=31%

Question 20.

In the extraction of iron in the blast furnace, lime stone is used to

( ) release CO2 for the reaction
( ) reduce the iron ore
( ) increase the strength of the iron
(+) remove impurities

Solution

The answer is "remove impurities"
Refer to Page 484 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 21.

The force with which an object is attracted to the earth is it's

( ) acceleration
( ) mass
(+) gravity
( ) weight
( ) momentum

Solution

The answer is "gravity "
Gravity
Gravity or gravitation is a natural phenomenon by which all things with energy are brought toward one another, including stars, planets, galaxies and even light and sub-atomic particles.

Question 22.

A train has an initial velocity of 44m/s and an acceleration of -4m/s2.its velocity after 10s is

( ) 2m/s
(+) 4m/s
( ) 8m/s
( ) 12m/s
( ) 16m/s

Solution

V=u+at where u=44m/s, a=-4ms2, t=10s, v=?
v=44+(-4 x 10)=44-40=4m/s
Refer to Page 16 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 23.

A man of mass 50kg ascends a flight of stairs 5m high in 5seconds. If the acceleration due to gravity is 10m/s, the power expended is

(+) 500W
( ) 400W
( ) 250W
( ) 200W
( ) 100W

Solution

$$Power = \frac{Force \times height}{Time} = \frac{mass \times gravity \times height}{Time}$$

$$= \frac{50 \times 10 \times 5}{5} = 500W$$

Refer to Page 29 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 24.

Longitudinal waves do not exhibit

( ) refraction
( ) reflection
( ) diffraction
(+) polarization
( ) disaggregation

Solution

The answer is "polarization"
Refer to Page 255 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 25.

The unit of quantity of electricity is called

( ) amperes
( ) the volt
(+) the coulomb
( ) the ammeter

Solution

The answer is "the coulomb"
In terms of SI base units, the coulomb is the equivalent of one ampere-second. Conversely,

an electric current of A represents 1 C of unit electric charge carriers flowing past a specific point in 1 s. The unit electric charge is the amount of charge contained in a single electron.

Question 26.

Which of the following is NOT a fundamental S.1. unit?

( ) metre
( ) ampere
( ) Kelvin
(+) radian

Solution

$$T \alpha \sqrt{L}$$

$$\frac{\sqrt{L_1}}{\sqrt{L_2}} = \frac{T_1}{T_2}$$

$$\sqrt{\left(L/_{2L}\right)} = 2/_{T_2}$$

$$T_2 = 2 \times \sqrt{0.5} = 1.41s$$

Refer to Page 167 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 27.

A simple pendulum with a period of 2.0s has its length doubled. Its new period is

( ) 1.00s
(+) 1.41s
( ) 0.35s
( ) 2.03s
( ) 2.83s

Solution

The answer I "1.41s

Question 28.

Which of the following will convert a milliammeter to a voltmeter?

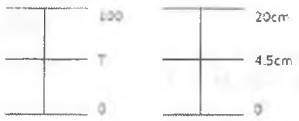
( ) low series resistance
( ) low parallel resistance
(+) high series resistance
( ) high parallel resistance
( ) medium parallel resistance

Question 29.

The distance between the fixed points of a centigrade thermometer is 20cm. what is the temperature when the mercury level is 4.5cm above the lower mark?

(+) 22.5C
( ) 29.0C
( ) 90.0C
( ) 100.0C
( ) 110.0C

Solution



$$\frac{4.5-0}{20-0} = \frac{T^0C-0}{100-0}$$

$$\therefore T^0C = 450/_{20} = 22.5^0C$$

Refer to Page 205 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 30.

The amount of heat needed to raise the temperature of 10kg of copper by 1K is it's

(+) specific heat capacity
( ) heat capacity
( ) latent heat
( ) internal heat
( ) specific latent heat

Solution

Specific heat is the amount of heat needed to raise the temperature of a certain mass by 1 degree Celsius.

Refer to Page 214 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015.

Question 31.

If sin(x + 30)° = cos 40°, find x.

( ) 10°
(+) 20°
( ) 59°
( ) 65°
( ) 80°

Solution

$$Sin(x+30)^0 = \cos 40^0 = \sin(90-40)$$

$$x+30=50$$

$$x = 50-30 = 20^0$$

Question 32.

Find the 9th term of the arithmetic progression, 18, 12, 6, 0, 6

( ) -54
(+) -30

( ) 30
( ) 42
( ) 54

Solution

$$a = 18, d = 6 - 12 = -6, n = 9$$

$$T_n = a + (n-1)d$$

$$T_9 = 18 + (9-1)(-6) = 18 - 48 = -30$$

Question 33.

Solve the equation: 4/a + 1/5a = 3

( ) 2.5
(+) 7/5
( ) 11/3
( ) 14/15
( ) 24/5

Solution

$$\frac{4}{a} + \frac{1}{5a} = 3$$

$$\frac{(20+1)}{5a} = 3$$

$$21 = 15a$$

$$\therefore a = \frac{21}{15} = \frac{7}{5}$$

Question 34.

What is the number whose logarithm to base 10 is 3.47712?

( ) 3.0
( ) 0.3
( ) 0.03
(+) 3000

Solution

$$Log_{10}^{x} = 3.47712$$

$$x = 10^{3.47712} = 3000$$

Question 35.

The nth term of a sequence is given by $(-1)^{n-2}2^{n-1}$ find the sum of the second and third terms.

(+) -2
( ) 1
( ) 2
( ) 6
( ) -1

Solution

$$n^{th} = (-1)^{n-2}2^{n-1}$$

$$T_2 = (-1)^{2-2}2^{2-1} = 2$$

$$T_3 = (-1)^{3-2}2^{3-1} = -1 \times 4 = -4$$

$$Sum: T_2 + T_3 = 2 + (-4) = 2 - 4 = -2$$

Question 36.

Evaluate $\log_{10}^{25} + \log_{10}^{32} - \log_{10}^{8}$

( ) 0.2
(+) 2
( ) 100
( ) 409
( ) 4

Solution

$$\log_{10}^{25} + \log_{10}^{32} + \log_{10}^{8} = \log_{10}\left(25 \times \frac{32}{8}\right)$$

$$= \log_{10}^{100} = 2\log_{10}^{10} = 2(1) = 2$$

Question 37.

Which is the value of x satisfying the equation $4^{2x}/4^{3x} = 2$?

( ) -2
(+) 1/2
( ) 1/4
( ) 3

Solution

$$\frac{4^{2x}}{4^{3x}} = 2$$

$$4^{-x} = 2$$

$$\frac{1}{4}^{x} = 2$$

$$4^{x} = \frac{1}{2}[taking log of_both_sides]$$

$$Log 4^{x} = \log \frac{1}{2}$$

$$\therefore x = \frac{\log \frac{1}{2}}{\log 4} = -\frac{1}{2}$$

Question 38.

Solve for x if $25^{x} + 3(5^{x}) = 4$

( ) 1 or -4
(+) 0
( ) 1
( ) -4 or 0
( ) -1

Solution

$25^x + 3(5^x) = 4;$

$5^{x(2)} + 3(5^x) = 4$

$Let 5x = y$

$y^2 + 3y - 4 = 0[factorizing_we_have]$

$(y-1)(y+4)$

$\therefore y = 1_or_-4$

$when_y = 1$

$5^x = y = 1$

$5^x = 5^0$

$\therefore x = 0$

Question 39.

Teams P and Q are involved in a game of football. What is the probability that the game ends in a draw.

(+) 1/4
( ) 1/3
( ) 1/2
( ) 2/3
( ) 2/5

Solution

The answer is "1/4 "

Question 40.

Find the value of m if $13_m + 24_m = 41_m$

( ) 8
(+) 6
( ) 5
( ) 2
( ) 9

Solution

$13_m + 24_m = 41_m$

$1 \times m^1 + 3 \times m^0 + 2 \times m^1 + 4 \times m^0 = 4 \times m^1 + 1 \times m^0$

$M + 3 + 2m + 4 = 4m + 1$

$3m + 7 = 4m + 1$

$4m - 3m = 7 - 1$

$\therefore m = 6$

Question 41.

Hydra removes undigested food by

( ) passing it through the anus
(+) passing it through the mouth
( ) means of a contractile vacuole
( ) egesting it through the body surface
( ) passing it through the nose

Solution

The answer is "passing it through the mouth "

Question 42.

A feature which adopts birds to flight is the possession of

( ) scaly legs
(+) light bones
( ) two walking legs
( ) a pointed beak
( ) combs

Solution

The answer is "light bones"

Question 43.

Physiological adaptation to very dry condition in animals is called

( ) hibernation
( ) aestivation
( ) rejuvenation
(+) xeromorphism

Question 44.

The organelle involved in tissue respiration is the

( ) endoplasmic reticulum
( ) vibosome
( ) golgi body
(+) mitochondrion

Question 45.

The blood vessel which carries blood from the alimentary canal to the lever is

( ) hepatic artery
( ) hepatic vein
(+) hepatic portal vein
( ) mesenteric
( ) hepatic mesenterism

Solution

The hepatic portal vein is a blood vessel that conducts blood from the gastrointestinal tract and spleen to the liver.

Question 46.

Soil with the finest particle is called

( ) silt

(+) clay
( ) sand
( ) gravel
( ) latrite

Question 47.

Interveinal chlorosis is normally associated with the deficiency of

(+) magnesium
( ) potassium
( ) iron
( ) calcium
( ) iodine

Question 48.

In Amoeba, osmoregulation is carried out by the

( ) pseudopodium
( ) food vacuole
(+) contractile vacuole
( ) nucleus

Question 49.

In animals, meiosis comes

( ) after fertilization
( ) after every mitotic division
( ) before fertilization
(+) before every mitotic division
( ) during fertilization

Question 50.

Which of the following is transmitted through mosquito bite

( ) filariasis
( ) typhus
( ) plague
( ) schistomaisis
(+) leprosy

2007

Question 1.

Shadows and eclipses result from the

( ) refraction of light
(+) rectilinear propagation of light
( ) diffraction of light
( ) reflection of light.

Solution

The propagation of light in straight line is called rectilinear propagation of light

Refer to Page 271-272 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 2.

An object, which is 3cm high is placed vertically 10cm in front of a concave mirror. If this object produces an image 40cm from the mirror, the height of the image is

( ) 0.75cm
( ) 4.00cm
( ) 8.00cm
(+) 12.00cm

Solution

$$\frac{Height_of_image}{Height_of_object} = \frac{image_distance}{Objec_distance}$$

$$\frac{h}{3} = \frac{40}{10}$$

$$h_1 = 4 \times 3 = 12cm$$

Question 3.

A boy looks at the image of an object in a plane mirror. He observes two images, a main bright one and the other faint. The observed images result from

(+) reflection only
( ) refraction only
( ) diffraction and interference
( ) reflection and refraction.

Solution

The answer is "reflection only"

Refer to Page 275 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 4.

For a short sighted person, light ray from a point on a very distant object is focused.

(+) in front of the retina
( ) on the retina by a converging lens
( ) behind the retina by a diverging lens
( ) in front of the retina at a distant of 2F from the lens.

Solution

The answer is "in front of the retina "

Question 5.

When light is incident on an object, which is magenta in color, which of the following colors would be absorbed?

( ) red and blue
(+) green only
( ) red and green
( ) red only.

Solution

The answer is "green only"

Refer to Page 304 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 6.

In a resonance tube experiment, the effective length of the air column for the first resonance is 20cm when set into vibration by a tuning fork of frequency 480Hz. Neglecting end effect, the velocity of sound in air is

( ) 96ms·1
( ) 255ms·1
( ) 340ms·1
(+) 384ms·1

Solution

L=20cm=0.2m, f=480Hz, V=?

For first resonance, Wave length=4L

$$V = f\lambda = f \times 4L = 480 \times 4 \times 0.2 = 384m/s$$

Refer to Page 329 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition) 2015

Question 7.

A sonometer wire of length 100cm under a tension of 10N, has a frequency of 250Hz. Keeping the length of the wire constant, the tension is adjusted to produce a new frequency of 350Hz. The new tension is

( ) 5.1 N
( ) 7.1N
( ) 14.0N
(+) 19.6N.

Solution

$$\frac{f_1}{f_2} = \frac{T_1}{T_2}$$

$f_1 = 250Hz,$

$f_2 = 350Hz,$

$T_1 = 10N,$

$T_2 = ?$

$$\frac{250}{350} = \frac{10}{T_2}$$

$$\frac{25}{49} = \frac{10}{T_2}$$

$$T_2 = {}^{490}\!/_{26} = 19.6N$$

Question 8.

One of the properties of the earth's magnetic field is that the

( ) north pole lies in the northern hemisphere

( ) geographic and magnetic meridians coincide

(+) earth's magnetic flux is entirely horizontal at a place where the magnetic dip is zero

( ) earth's magnetic flux is entirely vertical at a place where the magnetic dip is zero.

Solution

The answer is "earth's magnetic flux is entirely horizontal at a place where the magnetic dip is zero "

Question 9.

Three cells each of e.m.f 1.5V and an internal resistance of 1.0 are connected in parallel across a load of resistance 2.67. Calculate the current in the load

( ) 0.26A

(+) 0.41 A

( ) 0.50A

( ) 0.79A.

Solution

E=15v, r=1, R=2.67, I=?

From:

$$E = I(r + R)$$

$$1.5 = I(1 + 2.67)$$

$$I = {}^{1.5}\!/_{3.67} = 0.4A$$

Question 10.

A government spokesman announced that efforts..... the release of the hostages are continuing

(+) to obtain

( ) in obtaining

( ) for obtaining

( ) of obtaining.

Question 11.

I know you think I am talking nonsense, Shehu, but.....you'll realize that I was right

( ) at one time

( ) on time

(+) in time

( ) at times.

Question 12.

The inspector of Education who made several trips on the bad road returned yesterday completely..... by fever.

( ) brought down

( ) put down

(+) worn down

( ) worn off.

Question 13.

The vice principal asked the students to always .....their answers only from the textbooks recommended for the course

( ) look out

( ) search out

(+) look up

( ) bring up.

Question 14.

I know that your friend will not accept the proposal, ...

( ) and you neither

( ) and neither you

( ) neither do you

(+) neither will you.

Question 15.

Mark is a very handsome fellow who informs me that he has..... for pretty girls

( ) a heart

( ) a lip

(+) an eye

( ) a check.

Question 16.

Wale Agun, in creating his characters, draws freely..... his experience in life

(+) by
( ) in
( ) on
( ) of

Question 17.

When I have an appointment with someone, I hate..... waiting

( ) to be keeping
( ) for being kept
(+) being kept
( ) in being kept.

Question 18.

it's no good.....about the result until you have sat for the examination

( ) to worry
( ) for worrying
(+) worrying
( ) to have worried.

Question 19.

If you don't want to..... your car to robbers, then don't travel in the night

(+) loose
( ) loss
( ) lose
( ) lost.

Question 20.

The number 25 when converted from the tens and units base to the binary base (base two) is one of the following.

( ) 10011
( ) 111011
( ) 111000
(+) 11001
( ) 110011

Solution

2	25
2	12 R 1
2	6 R 0
2	3 R 0
2	1 R 1
	0 R 1

$=11001_2$

Question 21.

Evaluate $(6.3\times10^5)/(81\times10^3)$ to 3 significant figures

( ) 77.80
( ) 778.0
(+) 7.780
( ) 8.770
( ) 88.70

Solution

$$\frac{6.3\times10^5}{81\times10^3}=\frac{63\times10^4}{81\times10^3}=7.780(3sig.fig)$$

Question 22.

The positive root of t in the following equation, $4t^2+7t-1=0$ correct to 4 places of decimal, is

( ) 1.0622
( ) 10.6225
(+) 0.1313
( ) 0.3218
( ) 2.0132.

Solution

$$4t^2+7t-1=0$$

$$Almighty_formular$$

$$a=4, b=7, c=-1$$

$$t=\frac{-b\pm\sqrt{(b^2-4ac)}}{2a}=\frac{-7\pm\sqrt{7^2-4(4)(-1)}}{2(4)}$$

$$\frac{-7+8.05}{8}\,or\,\frac{-7-8.05}{8}$$

$$=0.13125, or 1.88125$$

$$=0.1313(4d.p)$$

Question 23.

The difference between the length and width of a rectangle is 6cm and the area is 135cm2. What is the length?

( ) 25cm
( ) 18cm
(+) 15cm
( ) 24cm
( ) 27cm.

Solution

$$L - W = 6.....(1)$$
$$LW = 135.....(2)$$
$$From(1), L = 6 + w.....(3)$$
$$Put(1)\,into\,o(2)$$
$$(6 + w)w = 135$$
$$w^2 + 6w - 135 = 0$$
$$(w - 9)(w + 15) = 0$$
$$\therefore W = 9, or - 15$$
$$L = 6 + w = 6 + 9 = 15$$

Question 24.

The first term of an Arithmetic Progression is 3 and the fifth term is 9. Find the number of the terms in the progression if the sum is 81.

( ) 12
( ) 27
(+) 9
( ) 4
( ) 36

Solution

$$T_5 = a + 4d = 9$$
$$3 + 4d = 9$$
$$4d = 6;$$
$$d = 6/4 = 1.5$$
$$S_n = n/2\,[2a + (n - 1)d] = 81$$
$$n[2(3) + (n - 1)1.5] = 81$$
$$3n^2 + 9n = 162$$
$$n^2 + 3n - 54 = 0$$
$$(n - 6)(n + 9) = 0$$
$$\therefore n = 6, or 9$$

Question 25.

The difference between 45/7 and 21/4 greater than the sum of 1/14 and 11/2

(+) 25/28
( ) 24/28
( ) 50/56
( ) 27/28
( ) 48/56

Solution

$$\frac{33}{7} - \frac{9}{4} = \frac{132 - 63}{28} = \frac{68}{28}$$
$$sum: \frac{1}{14} + \frac{3}{2} = \frac{1 + 21}{14} = \frac{11}{7}$$
$$\frac{68}{28} - \frac{11}{7} = \frac{68 - 44}{28} = \frac{25}{28}$$

Question 26.

A baking recipe calls for 2.5 kg of sugar and 4.5 kg flour. With this recipe some cakes were baked using 24.5 kg of a mixture of sugar and flour. How much sugar was used?

( ) 12.25 g
( ) 6.5 kg
(+) 8.75 kg
( ) 15.75 kg
( ) 8.25 kg

Solution

sugar=2.5kg,flour=4.5kg

sugar+flour=2.5+4.5=7kg

sugar used= $2.5/7 \times 24.5kg = 8.75kg$

Question 27.

The sum of the root of a quadratic is 5/2 and then product of its root is 4. The quadratic equation is

( ) $x^2 + 5x + 8 = 0$
( ) $x^2 - 5x + 8 = 0$
( ) $x^2 - 8x + 5 = 0$
( ) $x^2 + 8x - 5 = 0$
( ) $x^2 - 5x + 8 = 0$
(+) NONE

Solution

Let the roots be a & b

$a + b = 5/2 \ldots\ldots\ldots\ldots(1)$

$ab = 4 \ldots\ldots\ldots\ldots(2)$

$From(1),$

$2a + 2b = 5$

$a = \frac{5-2b}{2} \ldots\ldots\ldots\ldots(3)$

$putting(3) into(2)$

$\frac{[5-2b]b}{2} = 4$

$5b - 2b^2 = 8$

$2b^2 - 5b + 8 = 0$

Question 28.

Solve the given equation

$(\log 3)^2 - 6\log 3 + 9 = 0$

(+) 27

( ) 9

( ) 1/27

( ) 18

( ) 81

Solution

Using the Almighty formula, a=1.

$Let\ y = \log_3$

$y = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a} = \frac{6 \pm \sqrt{(36-36)}}{}$

$= \frac{6+0}{2} = \frac{6-0}{2}$

$y = 3(twice)$

$but\ y = \log_3 x$

$3 = \log_3 x$

$3^3 = x = 27$

Question 29.

In which order are the following salts se ...tive to light?

( ) AgI AgCl AgBr

( ) AgCl AgI AgBr

( ) AgBr AgCl AgI

(+) AgCl AgBr AgI.

Question 30.

$MnO^-_{4(aq)} + 8H^+_{(aq)} \rightarrow YMn^{2+}_{(aq)} + 4H_2O_{(l)}$

Y in the equation represents

( ) $2e^-$

( ) $3e^-$

(+) $5e^-$

( ) $7e^-$

Question 31.

Given that M is the mass of substance deposited in an electrolysis and Q the quality consumed, then Faraday's law can be written as

( ) Z/Q

( ) Q/Z

( ) Z/2Q

(+) M=QZ

Solution

Refer to Page 207 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 32.

Powdered marble reacts faster with hydrochloric acid solution than the granular form because the powdered form has

( ) more molecules

( ) more atoms

(+) larger surface area

( ) relatively large mass.

Question 33.

For a reaction in equilibrium, the species involved in the equilibrium constant expression are

( ) gaseous and solid species

( ) liquid and solid species

( ) solid and dissolved species

(+) gaseous and dissolved species.

Question 34.

A phenomenon where an element exists in different forms in the same physical state is known as

( ) isomerism

( ) amorphism

( ) allotropy

(+) isotropy.

Solution

Isotropy is the property of molecules and materials of having identical physical properties in all directions.

Question 35.

The substance often used for vulcanization of rubber is

( ) chlorine

( ) hydrogen peroxide

(+) sulphur

( ) tetraoxosulphate (VI) acid.

Solution

Refer to Page 384 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 36.

A gas that is not associated with global warming is

( ) CO2
( ) SO3
( ) CH4
(+) H2

Question 37.

The manufacture of carbohydrates by plants takes place only in

(+) the leaves
( ) the green stems
( ) chlorophyll us parts
( ) Flowering plants.

Question 38.

In water culture experiment, a plant showed poor growth and yellowing of the leaves. These may be due to deficiency of

( ) copper
( ) iron
(+) magnesium
( ) calcium.

Question 39.

In million's test, when the reagent is added to a protein food item, a white precipitate is produced which turns

( ) blue on heating
( ) yellow on heating
( ) green on heating
(+) red on heating.

Solution

Millon's reagent is an analytical reagent used to detect the presence of soluble proteins. A few drops of the reagent are added to the test solution, which is then heated gently. A reddish-brown coloration or precipitate indicates the presence of tyrosine residue which occur in nearly all proteins.

Question 40.

Regulation of blood sugar level takes place in the

(+) pancreas
( ) ileum
( ) liver
( ) kidney.

Solution

The human body wants blood glucose (blood sugar) maintained in a very narrow range. Insulin and glucagon are the hormones which make this happen. Both insulin and glucagon are secreted from the pancreas, and thus are referred to as pancreatic endocrine hormones.

Question 41.

Unicellular organisms transport essential nutrients directly to all parts of their bodies by the process of diffusion because they have

( ) a large volume to surface area ratio
(+) a large surface area to volume ratio
( ) their bodies immersed in the nutrients
( ) their outer membrane made of cellulose.

Question 42.

The heart of the adult frog consists of

( ) two auricles and two ventricles
( ) one auricle and one ventricle
(+) two ventricles and one auricle
( ) one ventricle and two auricles.

Question 43.

In adult mammalian blood, the cells, which lack nuclei, are the

( ) erythrocytes
( ) lymphocytes
( ) leucocytes
(+) phagocytes.

Question 44.

Which of the following movements occur during exhalation?

(+) the diaphragm and intercostals muscles relax
( ) the thoracic cavity increases in volume
( ) the diaphragm and intercostals muscles contrast
( ) the diaphragm contrast and the intercostals muscles relax.

Question 45.

In which of the following groups of animals is the Malphigian tubule found?

( ) lizards, snakes and frogs
(+) crickets, houseflies and grasshoppers
( ) millipedes, centipedes and scorpions
( ) earthworms, roundworms, and flatworms.

Solution

The answer is "crickets, houseflies and grasshoppers "

Malphigian tubule: A tubular excretory organ, numbers of which open into the gut in insects and some other arthropods.

2006

Question 1.

What volume of oxygen at s.t.p is required for the complete combustion of one mole of CH4?

( ) 61.5 litres
( ) 24.2 litres
(+) 44.8 litres
( ) 38.2 litres
( ) 54.4 litres

Solution

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

1 mole of CH4 requires 2 mole of O2

. Volume of O2 = 2 x 22.4dm3 = 44.8dm3

Refer to Page 87-88 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 2.

Calculate the pH of 0.1 molar acetic acid?

(+) 1
( ) 2
( ) 3
( ) 4
( ) 5

Solution

$$pH = -\log(0.1) = 1$$

Refer to Page 102-104 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 3.

Which of these compounds is a chloroform?

( ) CH3Cl
( ) CH2Cl
(+) CHCl3
( ) CCl4
( ) CH2Cl4

Solution

The answer is "CHCL3"

Refer to Page 358 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 4.

Hydrogen bonding is encountered in two different forms.

( ) intermolecular and interionic
( ) intermolecular and interdiatonic
( ) intermolecular and interatonic
(+) intermolecular and intramolecular
( ) intermolecular and intervalency

Solution

A **hydrogen bond** is the electrostatic attraction between polar groups that occurs when a **hydrogen** (H) atom bound to a highly electronegative atom such as nitrogen (N), oxygen (O) or fluorine (F) experiences attraction to some other nearby highly electronegative atom

Refer to Page 65 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 5.

Which of these catalyst is used for hydrogenation of Alkene.

( ) H2
( ) Na
(+) Pb
( ) Hg
( ) Ag

Solution

The answer is "Pb" (Lead)

Question 6.

The oxidizing agent commonly used for conversion of alcohol to aldehyde is

( ) potassium dichromate (IV)
( ) potassium dichromate (V)
(+) potassium dichromate (VI)
( ) potassium dichromate (VII)
( ) potassium dichromate (VIII)

Solution

Potassium dichromate(VI) is an oxidizing agent commonly used for conversion of alcohol to aldehyde

Refer to Page 543 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 7.

Which one of the following is a hygroscopic compound?

(+) H2S04
( ) NaOH
( ) HNO3
( ) NaCl
( ) ECl

Solution

A hygroscopic substance is one that readily attracts water from its surroundings, through either absorption or adsorption. Examples

include honey, glycerin, ethanol, methanol, concentrated sulphuric acid, and concentrated sodium hydroxide (lye).
Refer to Page 115 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 8.

Which of these is constant R for ideal gas?

( ) $8.314Jkmol^{-1}$
( ) $8.314J^{-1}Kmol^{-1}$
( ) $8.314kJKmol$
( ) $8.314kJ^{-}mol^{-1}$
(+) $8.314Jk^{-1}mol^{-1}$

Solution
Refer to Page 85 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 9.

Which of these compounds is a covalent compound?

( ) ZnS
( ) NaCl
( ) CsCl
(+) SiO2
( ) TiO2

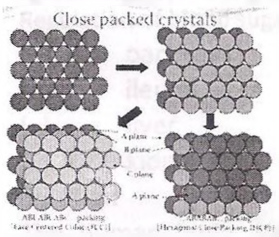
Solution
The answer is SiO2 (Sand)

Question 10.

Metallic elements usually have .....structure

( ) Packed
( ) limited packet
( ) slight packet
(+) close packet
( ) ring packet

Solution



Metallic elements usually have closed packet structure
Refer to Page 61 New School CHEMISTRY by Osei Yaw Ababio (Sixth Edition) 2013

Question 11.

All except one are protists.

(+) spirochaetes
( ) trypanosium
( ) paramecium
( ) chlamydomonas
( ) diatoms

Solution
The answer is spirochaetes

Question 12.

..... is not a green house gas.

( ) carbon dioxide
( ) methane
( ) chlorofluorocarbon
( ) nitrods oxide
(+) hydrogen sulphide

Solution
A greenhouse gas (sometimes abbreviated GHG) is a gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect. Hydrogen Sulphide is not a green house gas

Question 13.

Which of these ecosystem has the lowest primary productivity per square meter?

(+) salt marsh
( ) an open ocean
( ) a coral reef
( ) a grassland
( ) a tropical rain forest

Solution
The answer is "salt marsh"

Question 14.

Homologous chromosome segregate toward opposite poles of a dividing cell during

( ) mitosis
(+) meiosis
( ) meiosis II
( ) fertilization
( ) binary fission

Solution
The answer is Meiosis

Question 15.

Which organelle in paramecium is used for osmoregulation?

( ) cilia
( ) nucleus
(+) contractile Vacuole
( ) oral groove
( ) pellicle

Solution

A contractile vacuole (CV) is a sub-cellular structure (organelle) involved in osmoregulation. It is found predominantly in protists and in unicellular algae.

Question 16.

The shape of the chromosome is best studied during which phase in mitosis?

( ) prophase
(+) metaphase
( ) anaphase
( ) telophase
( ) cytokinesis

Solution

The answer is metaphase

Question 17.

The formation of urine involves all except one

( ) ultra filtration
( ) selective reabsorption
( ) tubular secretion
( ) formation of metabolic by products
(+) small molecule pass through the walls of capillaries into the capsular space

Solution

Refer to Page 339 Modern Biology by Sarajini T. Ramalingam, BSc(Hons.), PhD (Sixth Edition) 2013

Question 18.

Which of the following movements is seen in Hydra?

( ) swimming
( ) gliding
(+) looping
( ) crawling
( ) swaying

Looping movement of Hydra

Refer to Page 216-217 Modern Biology by Sarajini T. Ramalingam, BSc(Hons.), PhD (Sixth Edition) 2013

Question 19.

Nastic movements is in response to

( ) gravity
( ) directional stimuli
(+) non directional stimuli
( ) para tonic stimuli
( ) automatic stimuli

Solution

Nastic movements are non-directional responses to stimuli (e.g. temperature, humidity, light irradiance), and are usually associated with plants. The movement can be due to changes in turgor or changes in growth (therefore K+ ion concentration usually controls such movement is plants).

Question 20.

All are different types of ribonucleic acid except one,

( ) transfer ribonucleic
( ) messenger acid
( ) ribosomal ribonucleic acid
(+) chromosomal ribonucleic acid
( ) options A and C

Solution

There are 4 **types of RNA**, each encoded by its own **type** of gene mRNA - Messenger **RNA** Encodes amino acid sequence of a polypeptide tRNA - Transfer **RNA** Brings amino acids to ribosomes during translation rRNA - Ribosomal **RNA** With ribosomal proteins, makes up the ribosomes, the organelles that translate the mRNA.

Question 21.

Simplify the expression

$$\frac{2^{n+1}-2^{n-1}}{2^{n+1}-2^{n}}$$

( ) 2/3
( ) 7/2
( ) 9/2
(+) 3/2
( ) 2/5

Solution

$$\frac{2^{n+1}-2^{n-1}}{2^{n+1}-2^{n}}=\frac{2^{n}(2^{1}-2^{-1})}{2^{n}(2^{1}-1)}=2-\tfrac{1}{2}=\tfrac{3}{2}$$

Question 22.

Find the value of x if $3(2^x) = 24$

( ) 5
( ) 2
( ) 7
( ) 8
(+) 3

Solution

$$3(2^x) = 24;$$

$$2^x = 24/3 = 8$$

$$2^x = 2^3$$

$$\therefore x = 3$$

Question 23.

Find the value of K if the remainder when $3x^3 + kx^2 - 11x + 12$ is divided by x - 2 is 16

( ) - 1/2
(+) 1/2
( ) 2/3
( ) 3/2
( ) 2/5

Solution

$$x - 2 = 0$$

$$\therefore x = 2$$

$$f(2) = 16 = 3(2)^3 + K(2)^2 - 11(2) + 12$$

$$16 = 24 + 4k - 22 + 12$$

$$16 = 4k + 14$$

$$4k = 16 - 14 = 2;$$

$$\therefore k = 2/4 = 1/2$$

Question 24.

If $a = 1/2-\sqrt{3}$ and $1/2+\sqrt{3}$ Find the value of $a^2 + b^2$

( ) 17
(+) 14
( ) 9
( ) 7
( ) 12

Solution

$$\left(1/2-\sqrt{3}\right)\left(1/2-\sqrt{3}\right)+\left(1/2+\sqrt{3}\right)\left(1/2+\sqrt{3}\right)$$

$$= \frac{1}{4-4\sqrt{3}+3} + \frac{1}{4-4\sqrt{3}+3} = \frac{1}{7-4\sqrt{3}} = \frac{14}{(7-4\sqrt{3})(7+4\sqrt{3})}$$

$$= 14$$

Question 25.

The product of 3 numbers in geometric progression is 729. Find the second term.

( ) 12
( ) 7
( ) 5
(+) 9
( ) 11

Solution

Let the numbers be first term=a/r, second term= a, third term=ar; etc

Product:

$$a/r \times a \times ar = 729;$$

$$a^3 = 729$$

$$\therefore a = 9$$

Question 26.

If SinA = 4/5 and CosB = 12/13 Find the value of Sin(A + B)

(+) 63/65
( ) 23/11
( ) 61/67
( ) 5/13
( ) 12/13

Solution

$$Sin(A+B) = \sin A \cos B + \sin B \cos A$$

$$SinA = 4/5, CosA = 3/5, SinB = 5/13, CosB = 12/13$$

$$4/5 \times 12/13 + 3/5 \times 5/13 = 63/65$$

Question 27.

Simplify the expression

$$\frac{2\,4/5 \times 1\,1/7}{3\,1/9} \Big/ 3\,3/5$$

( ) 7/2
( ) 3/5
( ) 5/7
( ) 4/9
(+) 2/7

Solution

$$\frac{\frac{2\frac{4}{5} \times 1\frac{1}{7}}{3\frac{1}{9}}}{3\frac{3}{5}}$$

$$\frac{\frac{14}{5} \times \frac{8}{7} \times \frac{5}{18}}{\frac{28}{9}} = \frac{8}{9} \times \frac{9}{28} = \frac{2}{7}$$

Question 28.

Find the arithmetic mean of 8,3,5,12 and 10.

( ) 7.5
( ) 9.3
(+) 7.6
( ) 11.5
( ) 13.5

Solution

$$Mean = \frac{8+3+5+12+10}{5} = \frac{38}{5} = 7.6$$

Question 29.

Choose the option nearest in meaning to the underlined expression

The salesman tried to pull the wool over my eyes. This implies that the salesman tried to

( ) cover my eyes with wool his goods
( ) offer me cotton wool
( ) make me buy his wool
(+) dupe me
( ) cover my eyes with wool

Question 30.

Choose the option nearest in meaning to the underlined expression

Amaka counted her chickens before they are hatched. This means that Amaka

( ) regarded each egg as a chicken
( ) hatched the eggs prematurely
(+) assumed that her expectation have already been realized
( ) protected her eggs from breaking
( ) insured the eggs

Question 31.

Choose the option nearest in meaning to the underlined expression

The military governor upheld the decision of the cabinet.

( ) held up
( ) undercut
(+) maintained
( ) abolished
( ) reversed

Question 32.

Choose the option nearest in meaning to the underlined expression

Many untrustworthy students give evasive answers to questions which they fully understand.

( ) direct
( ) outspoken
( ) simple
( ) truthful
(+) clever

Question 33.

Choose the option nearest in meaning to the word(s) or phrase(s) underlined

He lost his voice momentarily.

( ) in a moment
( ) in a split second
(+) for a brief period of time
( ) without delay
( ) instantly

Question 34.

Choose the option nearest in meaning to the word(s) or phrase(s) underlined

The corrupt official has to leave the public service willy-nilly.

( ) unprepared
( ) reluctantly
( ) willingly
(+) compulsorily
( ) by retirement

Question 35.

Choose the expression or word which best completes each sentence

The headmaster was Interviewed in connection.....The expansion project

( ) to
(+) with
( ) for
( ) about
( ) at

Question 36.

Choose the expression or word which best completes each sentence

What do you want me to do now? I'm .....Withdrawing and keeping quiet.

( ) for
( ) with
( ) up
(+) off
( ) on

Question 37.

Choose from the options the word that has the same vowel sound as the one represented by the letter(s) underlined.

Research

(+) disturb
( ) comfort
( ) affair
( ) carry
( ) repeat

Question 38.

Select the word that has the same pattern of stress as the given word.

HONOUR

( ) Hostel
(+) hyena
( ) affair
( ) humane
( ) repeat

Question 39.

An automobile travels along a straight road at a velocity of 150m/s. a brake is applied and slows down to a velocity of 50m/s in 5s. Determine the distance it travels at the end of 5s.

( ) 50m
( ) 100m
( ) 25m
( ) 125m
(+) 225m

Solution

$$S = U + \tfrac{1}{2}at^2$$

$$S = 100 + \tfrac{1}{2} \bullet 10 \bullet 5^2$$

$$S = 100 + 5 \bullet 25$$

$$S = 100 + 125$$

$$S = 225$$

Question 40.

A spring is compressed through a distance of 0.05m to store 75J of energy. What is the spring constant?

( ) $15x10^4 N/M$
( ) $7.5X10^4 N/M$
( ) $5.0X10^4 N/M$
(+) $6.0x10^4 N/M$
( ) $8.0x10^4 N/M$

Solution

$$Work = \tfrac{1}{2}Ke^2$$

$$K = \frac{2 \times w}{e^2} = \frac{2 \times 75}{0.05^2} = 6.0 \times 10^4 N/m$$

Refer to Page 96 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition, 2015)

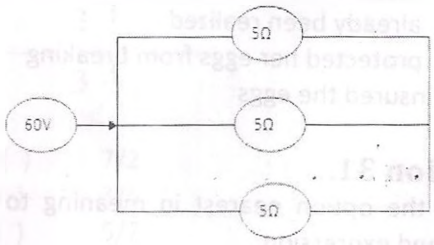
Question 41.

Three 5 ohms resistors connected in parallel have a potential difference of 60V applied across the combination. The current in each resistor is

( ) 4A
( ) 36A
(+) 12A
( ) 24A
( ) 10A

Solution

Since v across the resistors is the same,
I = V/R = 60/5 = 12A



Refer to Page 393 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition, 2015)

Question 42.

A transformer has 300 turns of wire in the primary coil and 30 turns in the secondary coil. If the input voltage is 100volts, the output voltage is

( ) 5volts
(+) 10 volts
( ) 15volts
( ) 20volts
( ) 25volts

Solution

$$N_p = 300, N_s = 30, V_p = 100, V_s = ?$$

$$\frac{N_s}{N_p} = \frac{V_s}{V_p}$$

$$V_s = \frac{N_s V_p}{N_p} = \frac{30 \times 100}{300} = 10$$

Refer to Page 445 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition, 2015)

Question 43.

A copper wire 20m long is heated from 20C to 70C if the linear expansivity of copper is 1.7 X 10^-5, calculate the increase in length.

(+) 0.017m
( ) 1.0m
( ) 17.00m
( ) 0.002m
( ) 1.72m

Solution

$$l_2 - l_1 = al_1(\Theta_2 - \Theta_1) = 1.7 \times 10^{-5} \times 20 \times 50 = 0.017$$

Refer to Page 38 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition, 2015)

Question 44.

If two plane mirrors intersect at an angle of 60, determine the images formed when an object is placed between them.

( ) 6
(+) 5
( ) 4
( ) infinite
( ) 10

Solution

$$ImagesFormed = 360/n - 1 = 360/60 - 1 = 6 - 1 = 5images$$

Refer to Page 278 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition, 2015)

Question 45.

An optical pin is placed 10.0cm from the pole of a convex mirror of focal length 15.0cm. What is the magnification of the image produced.

(+) 0.6
( ) 6.0
( ) 6.0cm
( ) 60
( ) 60cm

Solution

For convex mirror,

$$-1/f = \frac{1}{u} - \frac{1}{v}$$

$$u = 10cm$$

$$f = 15cm, v = ?$$

$$-1/15 = 1/10 - 1/v;$$

$$1/v = 1/10 + 1/15 = 1/6$$

$$\therefore v = 6cm$$

$$Magnification = image, v = 6 = 0.6$$

Refer to Page 286 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition, 2015)

Question 46.

The fundamental frequency produced by a violin string is 270Hz. what is the frequency of the fourth harmonic produced by this string.

( ) 270Hz
( ) 540Hz
( ) 810Hz
(+) 1080Hz
( ) 70Hz

Solution

Since first harmonic is f0
Fourth harmonics is 4f0
Therefore f=4x270=1080Hz

Refer to Page 337 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition, 2015)

Question 47.

The half-life of a certain radioactive nuclide is 9 hours. If the original mass of the nuclide is 28kg, determine the mass left after 1.5 days.

(+) 1.75kg
( ) 17.5kg
( ) 175kg
( ) 1.75g
( ) 17.5g

Solution

1.5 days is equivalent to 36days therefore

$$\frac{N}{2} 9hours$$

$$\frac{N}{4} 18hours$$

$$\frac{N}{8} 27hours \quad \therefore \frac{28kg}{16}$$

$$\frac{N}{16} 36hours \quad = 1.75kg$$

Refer to Page 472 New School PHYSICS by M.W. Anyakoha, Ph D (Fourth Edition, 2015)