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(1) The present worth of a certain bill due sometime hence is Rs. 800 and the true discount is Rs. 36. The banker's discount is:

[A] Rs. 37

[B] Rs. 37.62

[C] Rs. 34.38

[D] Rs. 38.98

Answer : [B]

Explanation:

$\text{B.G.} = \frac{(\text{T.D.})^2}{\text{P.W.}} = \text{Rs.} \left(\frac{36 \times 36}{800}\right) = \text{Rs. } 1.62$

$\therefore$ B.D. = (T.D. + B.G.) = Rs. (36 + 1.62) = Rs. 37.62

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(2) The banker's discount of a certain sum of money is Rs. 72 and the true discount on the same sum for the same time is Rs. 60. The sum due is:

[A] Rs. 360

[B] Rs. 432

[C] Rs. 540

[D] Rs. 1080

Answer : [A]

Explanation:

$\text{Sum} = \frac{\text{B.D. x T.D.}}{\text{B.D. - T.D.}} = \text{Rs.} \left(\frac{72 \times 60}{72 - 60}\right) = \text{Rs.} \left(\frac{72 \times 60}{12}\right) = \text{Rs. } 360.$

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(3) The banker's gain on a bill due 1 year hence at 12% per annum is Rs. 6. The true discount is:

[A] Rs. 72

[B] Rs. 36

[C] Rs. 54

[D] Rs. 50

Answer : [D]

Explanation:

$\text{T.D.} = \frac{\text{B.G. x 100}}{\text{R x T}} = \text{Rs.} \left(\frac{6 \times 100}{12 \times 1}\right) = \text{Rs. } 50.$

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(4)

The banker's gain on a certain sum due $1\frac{1}{2}$ years hence is $\frac{3}{25}$ of the banker's **discount. The rate percent is:**

[A]
$5\frac{1}{5}\%$

[B]
$9\frac{1}{11}\%$

[C]
$8\frac{1}{8}\%$

[D]
$6\frac{1}{6}\%$

Answer : [B]

Explanation:
Let, B.D = Re. 1.
Then, B.G. = Re. $\frac{3}{25}$.

$\therefore$ T.D. = (B.D. - B.G.) = Re. $\left(1 - \frac{3}{25}\right)$ = Re. $\frac{22}{25}$.

Sum = $\left(\frac{1 \times (22/25)}{1-(22/25)}\right)$ = Rs. $\frac{22}{3}$.

S.I. on Rs. $\frac{22}{3}$ for $1\frac{1}{2}$ years is Re. 1.

$\therefore$ Rate = $\left(\frac{100 \times 1}{\frac{22}{3} \times \frac{3}{2}}\right)\%$ = $\frac{100}{11}$ = $9\frac{1}{11}\%$.

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(5) The certain worth of a certain sum due sometime hence is Rs. 1600 and the true discount is Rs. 160. The banker's gain is:

[A] Rs. 20

[B] Rs. 24

[C] Rs. 16

[D] Rs. 12

Answer : [C]

Explanation:
B.G. = $\frac{(T.D.)^2}{P.W.}$ = Rs. $\left(\frac{160 \times 160}{1600}\right)$ = Rs. 16.

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(6) The angle between the minute hand and the hour hand of a clock when the time is 8.30, is:

[A] 80?

[B] 75?

[C] 60?

[D] 105?

Answer : [B]

Explanation:
Angle traced by hour hand in $\frac{17}{2}$ hrs = $\left(\frac{360}{12} \times \frac{17}{2}\right)^?$ = 255.

Angle traced by min. hand in 30 min. = $\left(\frac{360}{60} \times 30\right)^?$ = 180.

$\therefore$ Required angle = (255 - 180)? = 75?.

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(7) At what time, in minutes, between 3 o'clock and 4 o'clock, both the needles will coincide each other?

[A]
$5\frac{1}{11}''$

[B]
$12\frac{4}{11}''$

[C]
$4''$

$13\frac{}{11}$
[D]
$16\frac{4}{11}''$

Answer : [D]

Explanation:
At 3 o'clock, the minute hand is 15 min. spaces apart from the hour hand.
To be coincident, it must gain 15 min. spaces.
55 min. are gained in 60 min.
15 min. are gained in $\left(\frac{60}{55} \times 15\right)_{min} = 16\frac{4}{11}$ min.

$\therefore$ The hands are coincident at $16\frac{4}{11}$ min. past 3.

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(8) How many times do the hands of a clock coincide in a day?

[A] 20

[B] 21

[C] 22

[D] 24

Answer : [C]

Explanation:
The hands of a clock coincide 11 times in every 12 hours (Since between 11 and 1, they coincide only once, *i.e.,* at 12 o'clock).
AM
12:00
1:05
2:11
3:16
4:22
5:27
6:33
7:38
8:44
9:49
10:55

PM
12:00
1:05
2:11
3:16
4:22
5:27
6:33
7:38
8:44
9:49
10:55

The hands overlap about every 65 minutes, not every 60 minutes.
$\therefore$ The hands coincide 22 times in a day.

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(9) How many times in a day, the hands of a clock are straight?

[A] 22

[B] 24

[C] 44

[D] 48

Answer : [C]

Explanation:
In 12 hours, the hands coincide or are in opposite direction 22 times.
∴ In 24 hours, the hands coincide or are in opposite direction 44 times a day.

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(10) A watch which gains uniformly is 2 minutes low at noon on Monday and is 4 min. 48 sec fast at 2 p.m. on the following Monday. When was it correct?

[A] 2 p.m. on Tuesday

[B] 2 p.m. on Wednesday

[C] 3 p.m. on Thursday

[D] 1 p.m. on Friday

Answer : [B]

Explanation:
Time from 12 p.m. on Monday to 2 p.m. on the following Monday = 7 days 2 hours = 170 hours.
∴ The watch gains $\left(2 + 4\frac{4}{5}\right)_{\text{min.}}$ or $\frac{34}{5}$ min. in 170 hrs.

Now, $\frac{34}{5}$ min. are gained in 170 hrs.

∴ 2 min. are gained in $\left(170 \times \frac{5}{34} \times 2\right)_{\text{hrs}}$ = 50 hrs.

∴ Watch is correct 2 days 2 hrs. after 12 p.m. on Monday *i.e.,* it will be correct at 2 p.m. on Wednesday.

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(11) Which of the following fraction is the largest ?

[A]
$\frac{7}{8}$

[B]
$\frac{13}{16}$

[C]
$\frac{31}{40}$

[D]
$\frac{63}{80}$

Answer : [A]

Explanation:
L.C.M. of 8, 16, 40 and 80 = 80.
$\frac{7}{8} = \frac{70}{80}$; $\frac{13}{16} = \frac{65}{80}$; $\frac{31}{40} = \frac{62}{80}$

Since, $\frac{70}{80} > \frac{65}{80} > \frac{63}{80} > \frac{62}{80}$, so $\frac{7}{8} > \frac{13}{16} > \frac{63}{80} > \frac{31}{40}$

So, $\frac{7}{8}$ is the largest.

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(12) The least number, which when divided by 12, 15, 20 and 54 leaves in each case a remainder of 8 is:

[A] 504

[B] 536

[C] 544

[D] 548

Answer : [D]

Explanation:
Required number = (L.C.M. of 12, 15, 20, 54) + 8
= 540 + 8
= 548.

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(13) Which of the following has the most number of divisors?

[A] 99

[B] 101

[C] 176

[D] 182

Answer : [C]

Explanation:
99 = 1 x 3 x 3 x 11
101 = 1 x 101
176 = 1 x 2 x 2 x 2 x 2 x 11
182 = 1 x 2 x 7 x 13
So, divisors of 99 are 1, 3, 9, 11, 33, .99
Divisors of 101 are 1 and 101
Divisors of 176 are 1, 2, 4, 8, 11, 16, 22, 44, 88 and 176
Divisors of 182 are 1, 2, 7, 13, 14, 26, 91 and 182.
Hence, 176 has the most number of divisors.

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(14) If the sum of two numbers is 55 and the H.C.F. and L.C.M. of these numbers are 5 and 120 respectively, then the sum of the reciprocals of the numbers is equal to:

[A] $\frac{55}{601}$

[B] $\frac{601}{55}$

[C] $\frac{11}{120}$

[D] $\frac{120}{11}$

Answer : [C]

Explanation:
Let the numbers be a and b.
Then, $a + b = 55$ and $ab = 5 \times 120 = 600$.
$\therefore$ The required sum $= \frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{55}{600} = \frac{11}{120}$

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(15)
The H.C.F. of $\frac{9}{10}$, $\frac{12}{25}$, $\frac{18}{35}$ and $\frac{21}{40}$ is:

[A] $\frac{3}{5}$

[B] $\frac{252}{5}$

[C] $\frac{3}{}$

1400

[D] $\frac{63}{700}$

Answer : [C]

Explanation:

Required H.C.F. = $\frac{\text{H.C.F. of 9, 12, 18, 21}}{\text{L.C.M. of 10, 25, 35, 40}} = \frac{3}{1400}$

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(16) If 6th March, 2005 is Monday, what was the day of the week on 6th March, 2004?

[A] Sunday

[B] Saturday

[C] Tuesday

[D] Wednesday

Answer : [A]

Explanation:
The year 2004 is a leap year. So, it has 2 odd days.
But, Feb 2004 not included because we are calculating from March 2004 to March 2005. So it has 1 odd day only.
∴ The day on 6th March, 2005 will be 1 day beyond the day on 6th March, 2004.
Given that, 6th March, 2005 is Monday.
∴ 6th March, 2004 is Sunday (1 day before to 6th March, 2005).

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(17) On 8th Feb, 2005 it was Tuesday. What was the day of the week on 8th Feb, 2004?

[A] Tuesday

[B] Monday

[C] Sunday

[D] Wednesday

Answer : [C]

Explanation:
The year 2004 is a leap year. It has 2 odd days.
∴ The day on 8th Feb, 2004 is 2 days before the day on 8th Feb, 2005.
Hence, this day is Sunday.

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(18) January 1, 2007 was Monday. What day of the week lies on Jan. 1, 2008?

[A] Monday

[B] Tuesday

[C] Wednesday

[D] Sunday

Answer : [B]

Explanation:
The year 2007 is an ordinary year. So, it has 1 odd day.
1st day of the year 2007 was Monday.
1st day of the year 2008 will be 1 day beyond Monday.
Hence, it will be Tuesday.

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(19) January 1, 2008 is Tuesday. What day of the week lies on Jan 1, 2009?

[A] Monday

[B] Wednesday

[C] Thursday

[D] Sunday

Answer : [C]

Explanation:
The year 2008 is a leap year. So, it has 2 odd days.
1st day of the year 2008 is Tuesday (Given)
So, 1st day of the year 2009 is 2 days beyond Tuesday.
Hence, it will be Thursday.

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(20) On 8th Dec, 2007 Saturday falls. What day of the week was it on 8th Dec, 2006?

[A] Sunday

[B] Thursday

[C] Tuesday

[D] Friday

Answer : [D]

Explanation:
The year 2006 is an ordinary year. So, it has 1 odd day.
So, the day on 8th Dec, 2007 will be 1 day beyond the day on 8th Dec, 2006.
But, 8th Dec, 2007 is Saturday.
∴ 8th Dec, 2006 is Friday.
