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Karnataka Power Transmission Corporation Ltd

KPTCL Math Aptitude Sample Paper 2016 PDF Download

(1) The banker's discount on a sum of money for $1\frac{1}{2}$ years is Rs. 558 and the true discount on the same sum for 2 years is Rs. 600. The rate percent is:

[A] 10%

[B] 13%

[C] 12%

[D] 15%

Answer : [C]

Explanation:

B.D. for $\frac{3}{2}$ years = Rs. 558.

B.D. for 2 years = Rs. $\left(558 \times \frac{2}{3} \times 2\right)$

= Rs. 744

T.D. for 2 years = Rs. 600.

$\therefore$ Sum = $\frac{\text{B.D. x T.D.}}{\text{B.D. - T.D}}$ = Rs. $\left(\frac{744 \times 600}{144}\right)$ = Rs. 3100.

Thus, Rs. 744 is S.I. on Rs. 3100 for 2 years.

$\therefore$ Rate = $\left(\frac{100 \times 744}{3100 \times 2}\right)_{\%}$ = 12%

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(2) The banker's discount on Rs. 1600 at 15% per annum is the same as true discount on Rs. 1680 for the same time and at the same rate. The time is:

[A] 3 months

[B] 4 months

[C] 6 months

[D] 8 months

Answer : [B]

Explanation:

S.I. on Rs. 1600 = T.D. on Rs. 1680.

$\therefore$ Rs. 1600 is the P.W. of Rs. 1680, *i.e.,* Rs. 80 is on Rs. 1600 at 15%.

$\therefore$ Time = $\left(\frac{100 \times 80}{1600 \times 15}\right)_{\text{year}}$ = $\frac{1}{3}$ year = 4 months.

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(3) A hollow iron pipe is 21 cm long and its external diameter is 8 cm. If the thickness of the pipe is 1 cm and iron weighs 8 g/cm^3, then the weight of the pipe is:

[A] 3.6 kg

[B] 3.696 kg

[C] 36 kg

[D] 36.9 kg

Answer : [B]

Explanation:

External radius = 4 cm,

Internal radius = 3 cm.

Volume of iron = $\left(\frac{22}{7} \times [(4)^2 - (3)^2] \times 21\right)_{cm^3}$

= $\left(\frac{22}{7} \times 7 \times 1 \times 21\right)_{cm^3}$

$= 462\ cm^3$.

$\therefore$ Weight of iron = (462 x 8) gm = 3696 gm = 3.696 kg.

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(4) 66 cubic centimetres of silver is drawn into a wire 1 mm in diameter. The length of the wire in metres will be:

[A] 84

[B] 90

[C] 168

[D] 336

Answer : [A]

Explanation:
Let the length of the wire be h.
Radius = $\frac{1}{2}$mm = $\frac{1}{20}$cm. Then,

$\Rightarrow \frac{22}{7} \times \frac{1}{20} \times \frac{1}{20} \times h = 66.$

$\Rightarrow h = \left(\frac{66 \times 20 \times 20 \times 7}{22}\right) = 8400\ cm = 84\ m.$

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(5) A right triangle with sides 3 cm, 4 cm and 5 cm is rotated the side of 3 cm to form a cone. The volume of the cone so formed is:

[A] $12\pi\ cm^3$

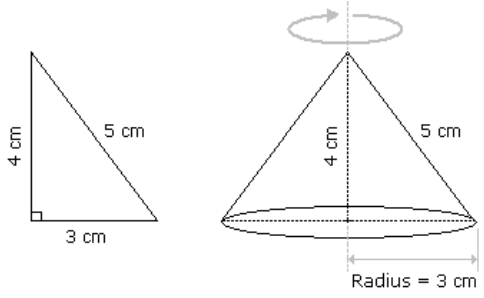
[B] $15\pi\ cm^3$

[C] $16\pi\ cm^3$

[D] $20\pi\ cm^3$

Answer : [A]

Explanation:



Clearly, we have $r = 3$ cm and $h = 4$ cm.
$\therefore$ Volume = $\frac{1}{3}\pi r^2 h = \left(\frac{1}{3} \times \pi \times 3^2 \times 4\right)_{cm^3} = 12\pi\ cm^3$.

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(6) The present worth of Rs. 1404 due in two equal half-yearly installments at 8% per annum simple interest is:

[A] Rs. 1325

[B] Rs. 1300

[C] Rs. 1350

[D] Rs. 1500

Answer : [A]

Explanation:
Required sum = P.W. of Rs. 702 due 6 months + P.W. of Rs. 702 due 1 year hence

$$= \text{Rs.} \left[\left(\frac{100 \times 702}{100 + 8 \times \frac{1}{2}} \right) + \left(\frac{100 \times 702}{100 + (8 \times 1)} \right) \right]$$

$$= \text{Rs. } (675 + 650)$$

$$= \text{Rs. } 1325.$$

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(7) The simple interest and the true discount on a certain sum for a given time and at a given rate are Rs. 85 and Rs. 80 respectively. The sum is:

[A] Rs. 1800

[B] Rs. 1450

[C] Rs. 1360

[D] Rs. 6800

Answer : [C]

Explanation:

$$\text{Sum} = \frac{\text{S.I.} \times \text{T.D.}}{(\text{S.I.}) - (\text{T.D.})} = \frac{85 \times 80}{(85 - 80)} = \text{Rs. } 1360.$$

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(8) Rs. 20 is the true discount on Rs. 260 due after a certain time. What will be the true discount on the same sum due after half of the former time, the rate of interest being the same?

[A] Rs. 10

[B] Rs. 10.40

[C] Rs. 15.20

[D] Rs. 13

Answer : [B]

Explanation:
S.I. on Rs. (260 - 20) for a given time = Rs. 20.
S.I. on Rs. 240 for half the time = Rs. 10.
T.D. on Rs. 250 = Rs. 10.

$$\therefore \text{ T.D. on Rs. 260} = \text{Rs. } \left(\frac{10}{250} \times 260 \right) = \text{Rs. } 10.40$$

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(9) The interest on Rs. 750 for 2 years is the same as the true discount on Rs. 960 due 2 years hence. If the rate of interest is the same in both cases, it is:

[A] 12%

[B] 14%

[C] 15%

[D] $16\frac{2}{3}\%$

Answer : [B]

Explanation:
S.I. on Rs. 750 = T.D. on Rs. 960.
This means P.W. of Rs. 960 due 2 years hence is Rs. 750.
$\therefore$ T.D. = Rs. (960 - 750) = Rs. 210.
Thus, S.I. on R.s 750 for 2 years is Rs. 210.

$$\frac{100 \times 210}{}$$

$\therefore$ Rate = $\left(\frac{750 \times 2}{} \right)\%$ = 14%

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(10) If the true discount on s sum due 2 years hence at 14% per annum be Rs. 168, the sum due is:

[A] Rs. 768

[B] Rs. 968

[C] Rs. 1960

[D] Rs. 2400

Answer : [A]

Explanation:
P.W. = $\frac{100 \times T.D.}{R \times T} = \frac{100 \times 168}{14 \times 2} = 600.$

$\therefore$ Sum = (P.W. + T.D.) = Rs. (600 + 168) = Rs. 768.

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(11) The captain of a cricket team of 11 members is 26 years old and the wicket keeper is 3 years older. If the ages of these two are excluded, the average age of the remaining players is one year less than the average age of the whole team. What is the average age of the team?

[A] 23 years

[B] 24 years

[C] 25 years

[D] None of these

Answer : [A]

Explanation:
Let the average age of the whole team by x years.
$\therefore$ $11x - (26 + 29) = 9(x - 1)$
$\Rightarrow 11x - 9x = 46$
$\Rightarrow 2x = 46$
$\Rightarrow x = 23.$
So, average age of the team is 23 years.

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(12) The average age of husband, wife and their child 3 years ago was 27 years and that of wife and the child 5 years ago was 20 years. The present age of the husband is:

[A] 35 years

[B] 40 years

[C] 50 years

[D] None of these

Answer : [B]

Explanation:
Sum of the present ages of husband, wife and child = (27 x 3 + 3 x 3) years = 90 years.
Sum of the present ages of wife and child = (20 x 2 + 5 x 2) years = 50 years.
$\therefore$ Husband's present age = (90 - 50) years = 40 years.

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(13) In Arun's opinion, his weight is greater than 65 kg but less than 72 kg. His brother doest not agree with Arun and he thinks that Arun's weight is greater than 60 kg but less than 70 kg. His mother's view is that his weight cannot be greater than 68 kg. If all are them are correct in their estimation, what is the average of different probable weights of Arun?

[A] 67 kg.

[B] 68 kg.

[C] 69 kg.

[D] Data inadequate

[E] None of these

Answer : [A]

Explanation:
Let Arun's weight by X kg.
According to Arun, 65 < X < 72
According to Arun's brother, 60 < X < 70.
According to Arun's mother, X <= 68
The values satisfying all the above conditions are 66, 67 and 68.
$\therefore$ Required average = $\left(\frac{66 + 67 + 68}{3}\right) = \left(\frac{201}{3}\right)$ = 67 kg.

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(14) A car owner buys petrol at Rs.7.50, Rs. 8 and Rs. 8.50 per litre for three successive years. What approximately is the average cost per litre of petrol if he spends Rs. 4000 each year?

[A] Rs. 7.98

[B] Rs. 8

[C] Rs. 8.50

[D] Rs. 9

Answer : [A]

Explanation:
Total quantity of petrol consumed in 3 years = $\left(\frac{4000}{7.50} + \frac{4000}{8} + \frac{4000}{8.50}\right)$ litres

= $4000\left(\frac{2}{15} + \frac{1}{8} + \frac{2}{17}\right)$ litres

= $\left(\frac{76700}{51}\right)$ litres

Total amount spent = Rs. (3 x 4000) = Rs. 12000.
$\therefore$ Average cost = Rs. $\left(\frac{12000 \times 51}{76700}\right)$ = Rs. $\frac{6120}{767}$ = Rs. 7.98

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(15) The average monthly income of P and Q is Rs. 5050. The average monthly income of Q and R is Rs. 6250 and the average monthly income of P and R is Rs. 5200. The monthly income of P is:

[A] 3500

[B] 4000

[C] 4050

[D] 5000

Answer : [B]

Explanation:
Let P, Q and R represent their respective monthly incomes. Then, we have:
P + Q = (5050 x 2) = 10100 .... (i)
Q + R = (6250 x 2) = 12500 .... (ii)
P + R = (5200 x 2) = 10400 .... (iii)
Adding (i), (ii) and (iii), we get: 2(P + Q + R) = 33000 or P + Q + R = 16500 .... (iv)
Subtracting (ii) from (iv), we get P = 4000.
$\therefore$ P's monthly income = Rs. 4000.

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(16) A, B and C jointly thought of engaging themselves in a business venture. It was agreed that A would invest Rs. 6500 for 6 months, B, Rs. 8400 for 5 months and C, Rs. 10,000 for 3 months. A wants to be the working member for which, he was to receive 5% of the profits. The profit

earned was Rs. 7400. Calculate the share of B in the profit.

[A] Rs. 1900

[B] Rs. 2660

[C] Rs. 2800

[D] Rs. 2840

Answer : [B]

Explanation:
For managing, A received = 5% of Rs. 7400 = Rs. 370.
Balance = Rs. (7400 - 370) = Rs. 7030.
Ratio of their investments = (6500 x 6) : (8400 x 5) : (10000 x 3)
= 39000 : 42000 : 30000
= 13 : 14 : 10
$\therefore$ B's share = Rs. $\left(7030 \times \frac{14}{37}\right)$ = Rs. 2660.

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(17) A and B started a business in partnership investing Rs. 20,000 and Rs. 15,000 respectively. After six months, C joined them with Rs. 20,000. What will be B's share in total profit of Rs. 25,000 earned at the end of 2 years from the starting of the business?

[A] Rs. 7500

[B] Rs. 9000

[C] Rs. 9500

[D] Rs. 10,000

Answer : [A]

Explanation:
A : B : C = (20,000 x 24) : (15,000 x 24) : (20,000 x 18) = 4 : 3 : 3.
$\therefore$ B's share = Rs. $\left(25000 \times \frac{3}{10}\right)$ = Rs. 7,500.

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(18) A and B started a partnership business investing some amount in the ratio of 3 : 5. C joined then after six months with an amount equal to that of B. In what proportion should the profit at the end of one year be distributed among A, B and C?

[A] 3 : 5 : 2

[B] 3 : 5 : 5

[C] 6 : 10 : 5

[D] Data inadequate

Answer : [C]

Explanation:
Let the initial investments of A and B be $3x$ and $5x$.
A : B : C = ($3x$ x 12) : ($5x$ x 12) : ($5x$ x 6) = 36 : 60 : 30 = 6 : 10 : 5.

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(19) A and B entered into partnership with capitals in the ratio 4 : 5. After 3 months, A withdrew $\frac{1}{4}$ of his capital and B withdrew $\frac{1}{5}$ of his capital. The gain at the end of 10 months was Rs. 760. A's share in this profit is:

[A] Rs. 330

[B] Rs. 360

[C] Rs. 380

[D] Rs. 430

Answer : [A]

Explanation:

$A : B = \left[4x \times 3 + \left(4x - \frac{1}{4} \times 4x\right) \times 7\right] : \left[5x \times 3 + \left(5x - \frac{1}{5} \times 5x\right) \times 7\right]$

$= (12x + 21x) : (15x + 28x)$
$= 33x : 43x$
$= 33 : 43.$

$\therefore$ A's share = Rs. $\left(760 \times \frac{33}{76}\right)$ = Rs. 330.

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(20) A, B, C rent a pasture. A puts 10 oxen for 7 months, B puts 12 oxen for 5 months and C puts 15 oxen for 3 months for grazing. If the rent of the pasture is Rs. 175, how much must C pay as his share of rent?

[A] Rs. 45

[B] Rs. 50

[C] Rs. 55

[D] Rs. 60

Answer : [A]

Explanation:
A : B : C = (10 x 7) : (12 x 5) : (15 x 3) = 70 : 60 : 45 = 14 : 12 : 9.

$\therefore$ C's rent = Rs. $\left(175 \times \frac{9}{35}\right)$ = Rs. 45.
