S1. Ans.(d)
Sol.

$$\text{Rate} = \frac{4800 \times 100}{16000 \times 2}$$

R = 15%

New rate = 15 + 5 = 20%

$$2 \text{ year CI on } 20\% = 20 + 20 + \frac{20 \times 20}{100}$$

= 44%

Interest obtained Satish

$$= (16000 + 4800) \times \frac{44}{100}$$

= 9152 Rs.

S2. Ans.(d)
Sol.
Let present age of father(F) be x years and age of son(S) is (50-x)years
F: S=x:$(50 - x)$
Eight years ago, $x - 8$: $42 - x$
From question ->$(x - 8)(42 - x) = 2(x - 8)$
$x = 40$, So father's age = 40, son = 10

S3. Ans.(c)
Sol.
According to first condition, Ratio of honey and water

$$= \frac{60-m}{n} = \frac{10}{1}$$

$\Rightarrow$ m + 10n = 60   ...(1)

According to second condition, Ratio of honey and water

$$= \frac{60-2m}{n} = \frac{8}{1}$$

$\Rightarrow$ m + 4n = 30   ...(2)

Solving eq. (1) and (2),

m = 10, n = 5

$\therefore$ m + n = 15

S4. Ans.(c)

Sol.

Amount received

$= 3,25,000 \times \frac{85}{100} \times \frac{90}{100}$

= Rs. 2,48,625

∴ Required difference = 76,375

S5. Ans.(a)

Sol.

Let money borrowed by Nitin was Rs. P

∴ $P \times 6 \times 3 + P \times 9 \times 5 + P \times 13 \times 3 = 8160 \times 100$

⇒ P = Rs. 8000

S6. Ans.(c)

Sol.

Let total no. of students = $100\,x$

Participated in sports = $12\,x$

Participated in Dancing = $\frac{3}{4}$ of $(100x - 12x) = 66x$

Participated in Singing = 10

Remaining students who didn't participate anywhere

$= (100\,x - 12\,x - 66\,x - 10\,x) = 12\,x$

According to given condition,

$12\,x \rightarrow 15$

Hence, $100\,x \rightarrow \frac{15}{12} \times 100 = 125$

Therefore, total no. of students = 125

S7. Ans.(a)

Sol.

Monthly income of Sameer

$= \frac{8.4}{12}$ lakh

= 70000 Rs.

Spend on Rent $= 70000 \times \frac{1}{7}$

= 10000

Spend on Food $= (70000 - 10000) \times \frac{1}{6}$

= 10000

Spend on (Coth + travel)

$$= (70000 - 20000) \times \frac{11}{20}$$

= 27500 Rs.

Saving = 22500 Rs.

$$\text{Expend on travel} = 27500 \times \frac{8}{25}$$

= 8800

Required difference = (22500 × 12 − 8800 × 12) Rs.

= (270000 − 105600) Rs.

= 164400 Rs.

S8. Ans.(c)
Sol.
Let capital of A = x
Then, capital of B = 2x
Capital of C = 2.5x
A : B : C = x × 4 : 2x × 6 : 2.5x × 12 = 2 : 6 : 15
∴ Share of B = $\frac{6}{2+6+15}$ × 5819 = Rs 1,518/-

S9. Ans.(c)
Sol.
Let, there are 'x' filling pipes,
Then no. of pipes that empty the tank = 8 − x
Now
ATQ,
$$\frac{8 - x}{6} - \frac{x}{8} = \frac{1}{6}$$
or, $32 - 7x = 4$
or, $7x = 28$
⇒ $x = 4$

S10. Ans.(c)
Sol.

Volume of a barrel of fountain pen = $\frac{22}{7}$ × 0.7 × 0.7 × 5 = 7.7 cm³

This barrel can be used to write 300 words.
Hence, a barrel of volume 15.4 cm³ can be used to write
$\frac{15.4}{7.7}$ × 300 = 600 words

S11. Ans.(d)

Sol.

$$\frac{55^{23} + 22^{55}}{7} = \frac{(49 + 6)^{23}}{7} + \frac{(21 + 1)^{55}}{7}$$

$$= \frac{6^{23}+1}{7} = \frac{6^{23}+1^{23}}{7}$$

When power is odd = n

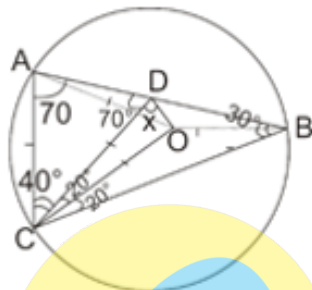$x^n + a^n$ have (x+a)

As a factor

$\Rightarrow 0$

S12. Ans.(c)

Sol.

First $= \frac{800 \times 80}{100} = 640\ Rs$

Second $= \frac{640-560}{640} = 12\frac{1}{2}\%$

S13. Ans.(b)

Sol.

$\angle OBC = 20° = \angle OCB\ (OB, OC\ radius)$

$\angle COB = 140°$

$\angle CAB = 70°\ (\angle COB = circumcenter)$

$\angle ACB = 180° - 70 - 30° = 80°$

$\angle ACD = 80° - 40° = 40°$

$\angle ACO = 60°$

$\Rightarrow \Delta ACO = equilateral$

$\angle ADC = 70° \Rightarrow (180° - 70° - 40°)$

$\Rightarrow \angle ADC = isocelose\ \Delta$

Side AC= CD

$\Rightarrow \Delta CDO = isocelose\ \Delta$

$\angle DCO = 20°$

$\Rightarrow CDO = \frac{180°-20°}{2} = 80°$

S14. Ans.(d)

Sol.

$\angle A : \angle B : \angle C = 3 : 2 : 1$

$\angle A = 90°$

$\angle B = 60°$

$\angle C = 30°$

$\angle ECD = 180° - (90° + 30°)$

$= 60°$
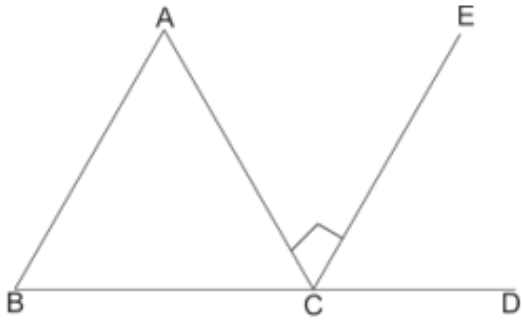
S15. Ans.(b)

Sol.

$GD : GA = 1:2$

$GE : GB = 1:2$
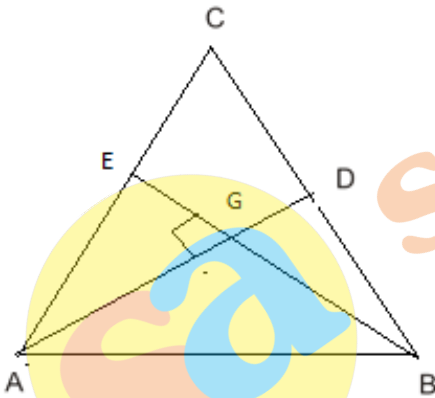
$AD = 9$ cm

$GD = 3$ cm

$GA = 6$ cm

$GE = 4$ cm

$GB = 8$ cm

$AB^2 = AG^2 + BG^2$

$= 6^2 + 8^2$

$AB = 10$

S16. Ans.(a)

Sol. $180 \times 7 : 160 \times 5 = 63 : 40$

S17. Ans.(b)
Sol.
Direct common tangent
$$= \sqrt{10^2 - (4-3)^2} = \sqrt{99}$$
Transverse common tangent
$$= \sqrt{10^2 - (3+4)^2} = \sqrt{51}$$
Ratio $= \sqrt{33} : \sqrt{17}$

S18. Ans.(d)
Sol.
$1 \rightarrow 16$
$4 \rightarrow 64$ but after discount $= 56$
Discount $= \frac{8 \times 100}{64} \% = 12.5\%$

S19. Ans.(c)
Sol.
Let the speed of A = a & B = b
ATQ,

		A	B
For situation I	Distance	1000	970-20b
Situation II	Distance	980	1000-30b

$$\frac{1000}{970-20b} = \frac{980}{1000-30b}$$
$$\frac{100}{97-2b} = \frac{98}{100-3b}$$
$10000-300b = 97 \times 98 - 196b$
$10000 - 97 \times 98 = 104b$
$10000 - 9506 = 104b$
$b = \frac{494}{104} = \frac{247}{52} = 4.75 \; m/s$

S20. Ans.(b)
Sol.
percentage growth of C
$$= \frac{6.4 - 4.8}{4.8} \times 100 = 33\frac{1}{3}\%$$

S21. Ans.(d)
Sol.
$$N_1 \; : \; N_2 \; : \; N_3$$
$$50 \; : \; 10 \; : \; 100$$
% increase N_2 in to make it equal to N_1

$$= \frac{50-10}{10} \times 100 = 400\%$$

S22. Ans.(c)
Sol.
$$\frac{2714}{5074} = \frac{23 \times 118}{43 \times 118} = \frac{23}{43}$$

S23. Ans.(a)
Sol.
cosec 120° = cosec (90° + 30°)

$$= \sec 30° = \frac{2}{\sqrt{3}}$$

S24. Ans.(a)
Sol.
$$2\pi r = 22 \Rightarrow r = \frac{7}{2} \text{cm}$$
$$\pi r^2 h = 770 \Rightarrow h = 20 \text{ cm}$$
Curved surface area = 2πrh
$$= 2 \times \frac{22}{7} \times \frac{7}{2} \times 20$$
$$= 440 \text{ cm}^2$$

S25. Ans.(b)
Sol.
Sum of interior angles = (n – 2) × 180°
= (14 – 2) × 180°
= 2160°

S26. Ans.(a)
Sol.
$$\text{Distance} = \frac{5 \times 0.35}{(7-5)} \text{km}$$
$$= 0.875 \text{ km} = 875 \text{ m}$$

S27. Ans.(a)
Sol.
ATQ,
$$\frac{(A \times 25)}{\frac{3}{4}} = \frac{(A+B) \times 5}{\frac{1}{4}}$$
$$\frac{A}{B} = \frac{3}{2}$$
Total work = $\dfrac{3 \times 25}{\left(\frac{3}{4}\right)}$ or $\dfrac{(3+2) \times 5}{\frac{1}{4}}$
= 100 units
$$\text{B, alone} = \frac{100}{2} = 50 \text{ days.}$$

S28. Ans.(a)

Sol.

Let the nos be

$$\underbrace{(n-28), (n-26)........}_{14\,nos} n \underbrace{......(n+26)(n+28)}_{14\,nos}$$

When the total nos are odd then the middle no is always their mean.

$\therefore n = 60$

Highest no. = n + 28 = 88

S29. Ans.(b)

Sol.

[4 (2x – 3y) + 5 (x + 4y)] – [5 (2x – y)]

= [13x + 8y] – [10x – 5y]

= 3x + 13y

S30. Ans.(d)

Sol.

From, 3(2 – 3x) < 2 – 3x $\Rightarrow x > \frac{2}{3}$

From, 2 – 3x ≥ 4x – 6 $\Rightarrow x \le \frac{8}{7}$

From given options, only (d) X= 1 satisfies both equations.