SSC Test Series -21. Solution

(New Pattern)

1	C	26	B	51	A	76	A
2	D	27	B	52	A	77	D
3	B	28	C	53	D	78	C
4	D	29	B	54	C	79	B
5	A	30	D	55	B	80	C
6	C	31	A	56	A	81	B
7	D	32	A	57	B	82	B
8	A	33	B	58	D	83	A
9	C	34	A	59	C	84	C
10	C	35	D	60	D	85	A
11	C	36	C	61	A	86	C
12	C	37	A	62	D	87	C
13	C	38	D	63	B	88	A
14	A	39	D	64	B	89	D
15	C	40	A	65	A	90	B
16	D	41	C	66	A	91	B
17	D	42	B	67	C	92	D
18	C	43	D	68	D	93	C
19	C	44	A	69	C	94	D
20	D	45	C	70	C	95	B
21	D	46	D	71	C	96	A
22	C	47	D	72	A	97	C
23	C	48	A	73	A	98	D
24	C	49	D	74	B	99	A
25	d	50	C	75	d	100	A

26. (B) The required remainder = $d_1 \times r_2 + r_1$

where, d_1 = the first divisor = 12

r_1 = the first remainder = 4

r_2 = the second remainder = 6

$\therefore$ The required remainder = 12 × 6 + 4 = 76

27. (B) Oder of surds are 4, 3, 2. LCM of 4, 3, and 2 is 12.
So, convert each surd into a surd order 12

$\sqrt[4]{10} = \sqrt[12]{(10)^3} = \sqrt[12]{1000}$

$\sqrt[3]{6} = \sqrt[12]{(6)^4}\ \sqrt[12]{1296}$

$\sqrt{3} = \sqrt[12]{(3)^6} = \sqrt[12]{729}$

$\sqrt[3]{6} > \sqrt[4]{10} > \sqrt{3}$

28. (C) Number of one digit pages from 1 to 9 = 9
Number of two digit pages from 10 to 99 = 90
Number of three digit pages from 100 to 200 = 101
$\therefore$ Total number of required figures
= (9 × 1) + (90 × 2) + (101 × 3) = 492

29. (B)

30. (D) LCM of 3, 5, 6, 8, 10 and 12 = 120
Required number = 120 K + 2 ; K is a positive integer.

120	9
117	
3	

120 K + 2 = (13 × 9 + 3) K + 2
= (13 × 9 × K) + (3K + 2)
For every value of K, (13 × 27 × K) is always divisible by 13.
Putting value of K equal to 1, 2, 3, 4, ….. etc.
In succession, we find that number 8.
Least value of K which will make (3K + 2) divisible by 13 is 8.
$\therefore$ The required number = 120 × 8 + 2
= 960 + 2
= 962

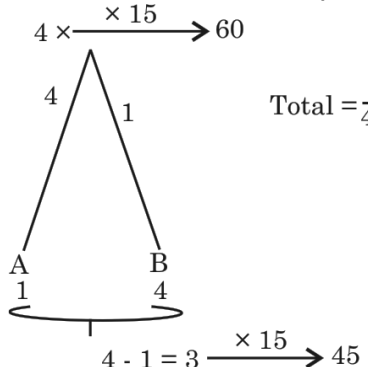
31. (A) B's profit = $\text{Rs.}\frac{235-45}{2} = \text{Rs.}95$
A's profit = Rs. 95 + 45 = Rs. 95
A's profit per month = Rs. $\frac{140}{3}$
B's profit per month = Rs. $\frac{95}{4}$
Their capitals are proportional to their profit,
A's capital : B capital $= \frac{140}{3} : \frac{95}{4} = 112 : 57$
Difference between their capitals = 112 – 57 = 55,
but the actual difference is 550.
A's capital $= 112 \times \frac{550}{55} = \text{Rs.}1120$

32. (A) House containing only one person
= 100 – 40 = 60%
Houses containing only a male
$= 60 \times \frac{20}{100} = 12\%$
Houses containing only one female
= 60 – 12 = 48%

33. (B) Ratio of parts
$= \frac{1}{100+2\times5} : \frac{1}{100+3\times5} : \frac{100}{100+4\times5}$
$\frac{1}{100} : \frac{1}{115} : \frac{1}{120}$
$= 276 : 264 : 253 = 793\ \frac{95}{4}\ 177930$
Difference between greatest and smallest
= (276 – 253) × 10 = Rs. 230

34. (A) S is 4 times as fast as B.

It means if A does a work in 1 day then B will do in 4 days.



$\text{Total} = \frac{60}{4+1} = 12 \text{ days}$

$4 - 1 = 3 \xrightarrow{\times 15} 45$

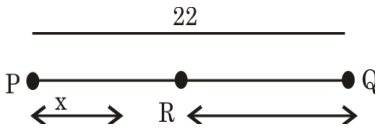
35. (D) Payment is quarterly, so, r = 4%, t = 8 years
Required answer

$$= \frac{100 \times 2280}{100 \times 8 + \frac{8 \times 7 \times 4}{2}}$$

$$= \frac{2280 \times 100}{912}$$

$$= \text{Rs.}250$$

36. (C)



Time taken by to reach R from P = Time taken by B to Reach Q and return from Q to R

$$\Rightarrow \frac{x}{5} = \frac{22}{6} + \frac{22-x}{6}$$

$$\Rightarrow \frac{x}{5} + \frac{x}{6} = \frac{22}{6} + \frac{22}{6}$$

$$\Rightarrow \frac{11x}{30} = \frac{22}{3}$$

$$\Rightarrow x = 20 \text{ km}$$

37. (A) Let the distance between Delhi and Kanpur is x. Let train leaving from Delhi is A and from Kanpur is B.

A's speed = $\frac{x}{10\text{am} - 5\text{am}} = \frac{x}{5}\text{km/hour}$

B's speed = $\frac{x}{2\text{pm} - 7\text{am}} = \frac{x}{7}\text{km/hour}$

Distance covered by A till 7 am $= \frac{2x}{5}\text{km}$

Remaining Distance = $x - \frac{x}{5} = \frac{3x}{5}\text{km}$

Relative speed $= \frac{x}{5} + \frac{x}{7} = \frac{12x}{35}\text{km/hour}$

Time taken by both trains to cover the distance

$$\frac{\frac{3}{5}x}{\frac{12x}{35}} = \frac{7}{4}\text{hours} = 1\text{hours } 45 \text{ min}$$

$\therefore$ The two trains will meet at 7 am + 1 hour 45 min
= 8 : 45 am

38. (D) Take $\theta = 45°$

x = 1 + 1 = 2

$$y = \sqrt{2} - \frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}}$$

$$\left(x^2y\right)^{\frac{2}{3}} - \left(xy^2\right)^{\frac{2}{3}}$$

$$= \left(4 \times \frac{1}{\sqrt{2}}\right)^{\frac{2}{3}} - \left(2 \times \frac{1}{2}\right)^{\frac{2}{3}}$$

$$= \left(2 \times \sqrt{2}\right)^{\frac{2}{3}} - (1)^{\frac{2}{3}}$$

$$= 2 - 1$$

$$= 1$$

39. (D) $z = \frac{\sqrt{1+\sin x} + \sqrt{1-\sin x}}{\sqrt{1+\sin x} - \sqrt{1-\sin x}}$

$$\Rightarrow \frac{\left(\sqrt{1+\sin x} + \sqrt{1-\sin x}\right)}{\left(\sqrt{1+\sin x} - \sqrt{1-\sin x}\right)} \times \frac{(\sqrt{1+\sin x} + \sqrt{1-\sin x})}{(\sqrt{1+\sin x} - \sqrt{1-\sin x})}$$

$$\Rightarrow z = \frac{1+\sin x + 1 - \sin x + 2\sqrt{1+\sin x} \times \sqrt{1-\sin x}}{1+\sin x - 1 + \sin x}$$

$$\Rightarrow z = \frac{2 + 2\sqrt{1+\sin x} \times \sqrt{1-\sin x}}{2\sin x}$$

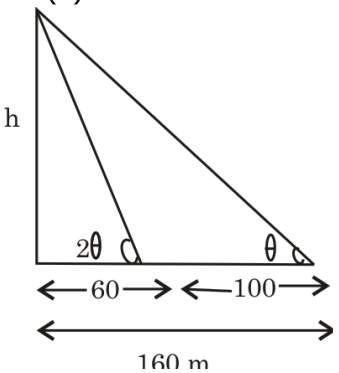
$$\Rightarrow z = \frac{1 + \sqrt{1-\sin^2 x}}{\sin x}$$

$$\Rightarrow z = \frac{1 + \sqrt{\cos^2 x}}{\sin x}$$

$$\Rightarrow z = \frac{1+\cos x}{\sin x}$$

$$\Rightarrow z = \text{cosec } x + \cot x$$

40. (A)



$\tan\theta = \frac{h}{160}$

$\tan 2\theta = \frac{h}{60}$

$\tan 2\theta = \frac{2\tan\theta}{1-\tan^2\theta}$

$\Rightarrow \frac{h}{50} = \frac{2\times\frac{h}{160}}{1-\left(\frac{h}{160}\right)}$

$\Rightarrow \frac{80}{60} = \frac{1}{1-\left(\frac{h}{160}\right)^2}$

$\Rightarrow 1-\left(\frac{h}{160}\right)^2 = \frac{60}{80}$

$\Rightarrow \left(\frac{h}{160}\right)^2 = \frac{1}{4}$

$\Rightarrow \frac{h}{160} = \frac{1}{2}$

$\Rightarrow h = 80$ m

41. (C) $x^{x\sqrt{x}} = (x\sqrt{x})^x$

$\Rightarrow x^{x^{3/2}} = \left(x^{\frac{3}{2}}\right)^x$

$\Rightarrow x^{x^{3/2}} = x^{\frac{3}{2}x}$

By comparing

$x^{\frac{3}{2}} = \frac{3}{2}x$

$\Rightarrow x^{\frac{1}{2}} = \frac{3}{2}$

$\Rightarrow x = \frac{9}{4}$

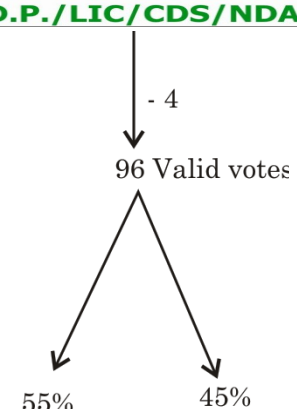
42. (B) If $x^2 = y+z, y^2 = z+x, z^2 = x+y$

Now, $\frac{1}{x+1}+\frac{1}{y+1}+\frac{1}{z+1}$

$= \frac{x}{x^2+x}+\frac{y}{y^2+y}+\frac{z}{z^2+z}$

$= \frac{x}{x+y+z}+\frac{y}{y^2+y}+\frac{z}{x+y+z} = 1$

43. (D) Let total votes = 100

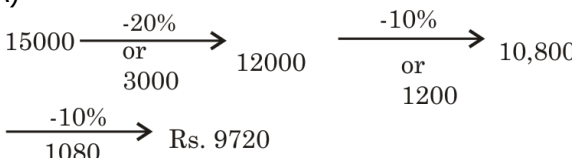


$55\% - 45\% = 10\%$ of 96 $\rightarrow$ 240

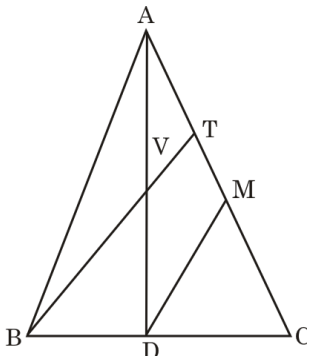
$100 \rightarrow \frac{240}{96\times10}\times100\times100$

$= 2500$ votes

44. (A)



45. (C)



$AT = 6$ (given)

$\Delta AVT \sim \Delta ADM$

$\frac{AV}{AD} = \frac{AT}{AM}$

$\frac{1}{2} = \frac{6}{AM}$

$\Rightarrow AM = 12$

$\therefore TM = 6$

$\Delta CDM \sim \Delta CBT$

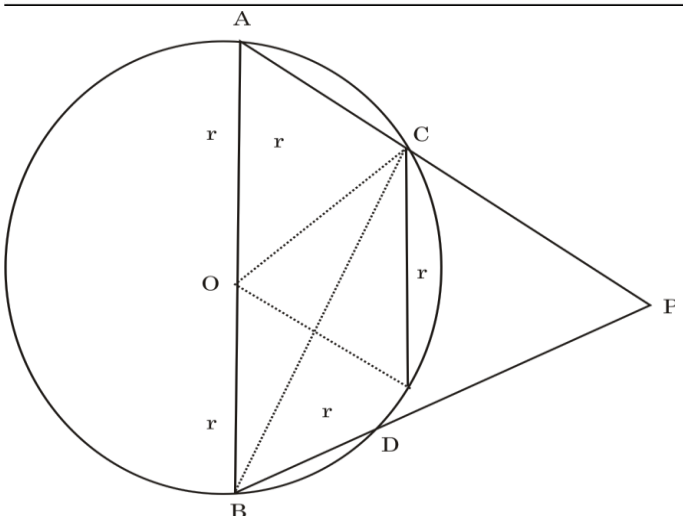
$\frac{CD}{BD} = \frac{CM}{TM}$

$\Rightarrow \frac{1}{1} = \frac{CM}{6}$

$\Rightarrow CM = 6$

$= 6+6 = 12$

46. (D)



ΔOCD is equilateral triangle.

$\angle COD = 60°$

$\therefore \angle CBD = 30°$ (angle form by chord to circumference is Half of form by chord to centre.)

$\therefore \angle ACB = 90°$

$\therefore \angle BCP = 180° - 90°$

In ΔCBP

$\angle BCP + \angle CBP + \angle CPB = 180°$

$\Rightarrow 90° + 30° + \angle CPB = 180°$

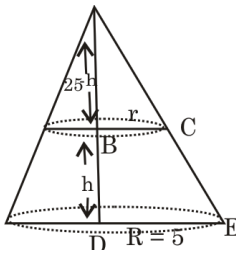
$\Rightarrow \angle CPB = 60°$

and $\angle APB = 60°$

47. (D) R = 5 cm

H = 25 cm

$\Delta ABC \sim \Delta ADE$



$\Rightarrow 25 - h = 5r$

$\Rightarrow h = 25 - 5r$

Volume of frustrum $= \frac{1}{3}\pi h(R^2 + r^2 + Rr)$

$110 = \frac{1}{3} \times \frac{22}{7} \times (25 - 5r)(25 + r^2 + 5r)$

$\Rightarrow 21 \times 5 = (25 - 5r)(25 + r^2 + 5r)$

$\Rightarrow 21 = (5 - r)(25 - r^2 + 5r)$

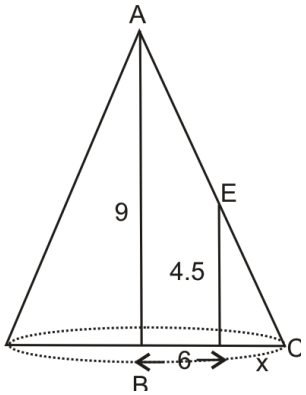
$\Rightarrow 21 = 5^3 - r^3$

$\Rightarrow 21 = 125 - r^3$

$\Rightarrow r^3 = 104$

$\Rightarrow r = \sqrt[3]{104}$ cm

48. (A)



$\Delta ABC \sim \Delta EDC$

$\frac{9}{4.5} = \frac{6 + x}{x}$

$2x = 6 + x$

$x = 6$

BC = 12 cm

$l = AC = \sqrt{AB^2 + BC^2}$

$= \sqrt{81 + 144}$

$= \sqrt{225}$

$= 15m$

Lateral surface area = πrl

$= \frac{22}{7} \times 12 \times 15$

= 565.7 m^2

49. (D) Percentage variation in

Model A $= \frac{40 - 30}{30} \times 100 = 33\frac{1}{3}\%$

Model B $= \frac{20 - 15}{15} \times 100 = 33\frac{1}{3}\%$

Model C $= \frac{20 - 15}{15} \times 100 = -25\%$

50. (C) Required answer

$= 35 \times \frac{10}{100} \times \frac{15}{100} + 44 \times \frac{10}{100} \times \frac{15}{100}$

$= \frac{150}{10000} \times 79 = 1.1850$ lakhs

= Rs. 1,18,500

Q. 76. (a) No Error

Q. 77. (d) Replace 'to' by 'with'

Q. 78. ©Use 'did she finish' in place of 'she finished'. When the sentence is introduced by an adverb, or when the verb is meant to express a wish or prayer, the inverted form of verb is used.

Example. No sooner did she arrive than she sarted.