

**ALL INDIA OPEN TEST SERIES**

*for*

**TARGET NTSE-2017-18**

**PART TEST – 2**

**(31<sup>st</sup> July 2017)**

***MAT, ENGLISH & SAT***  
***(OBJECTIVE)***

*Please handover this booklet only after the  
examination is over.*

***ANSWERS***  
***&***  
***SOLUTIONS***

**FIITJEE****TARGET NTSE-2017-18****ANSWERS, HINTS & SOLUTIONS****PART TEST – 2****MAT****(Paper – 1)****CODE : 1004****921 FIITJEE students qualified in (2016-17) for NTSE Stage II****ALL INDIA OPEN TEST SERIES**

| Q. No. | ANSWERS | Q. No. | ANSWERS |
|--------|---------|--------|---------|
| 1.     | B       | 30.    | A       |
| 2.     | C       | 31.    | C       |
| 3.     | C       | 32.    | B       |
| 4.     | A       | 33.    | C       |
| 5.     | B       | 34.    | B       |
| 6.     | C       | 35.    | D       |
| 7.     | C       | 36.    | D       |
| 8.     | B       | 37.    | B       |
| 9.     | D       | 38.    | C       |
| 10.    | D       | 39.    | C       |
| 11.    | C       | 40.    | D       |
| 12.    | D       | 41.    | D       |
| 13.    | D       | 42.    | D       |
| 14.    | A       | 43.    | A       |
| 15.    | D       | 44.    | B       |
| 16.    | A       | 45.    | D       |
| 17.    | D       | 46.    | D       |
| 18.    | B       | 47.    | D       |
| 19.    | B       | 48.    | A       |
| 20.    | B       | 49.    | D       |
| 21.    | A       | 50.    | D       |
| 22.    | A       |        |         |
| 23.    | B       |        |         |
| 24.    | A       |        |         |
| 25.    | A       |        |         |
| 26.    | D       |        |         |
| 27.    | A       |        |         |
| 28.    | B       |        |         |
| 29.    | B       |        |         |

## HINTS & SOLUTIONS

1. B

Sol.  $P \left[ 1 + \frac{r}{2 \times 100} \right]^4 \Rightarrow 20000 \left[ 1 + \frac{15}{200} \right]^4 = 26709 \text{ app.}$

2. C

Sol.  $P \left[ \frac{x}{\left(1 + \frac{r}{100}\right)} + \frac{x}{\left(1 + \frac{r}{100}\right)^2} \right] \Rightarrow 21000 = \left[ \frac{x}{1 + \frac{10}{100}} + \frac{x}{\left(1 + \frac{10}{100}\right)^2} \right]$

$\therefore x = 12100 \text{ Rs}$

3. C

Sol. I 1500  
II 1500 225

4. A

Sol. p should be greater than q

5. B

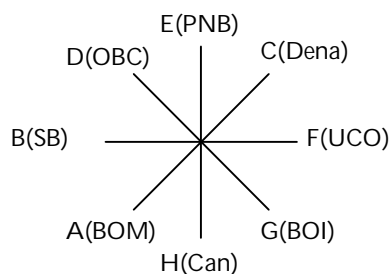
Sol. I 1000

II  $\begin{cases} 500 & 50 \\ 500 & 75 & 2.5 \end{cases}$

$2000 + 125 + 2.5 = 2127.5$   
 $2127.5 + 10000 = 12127.5$

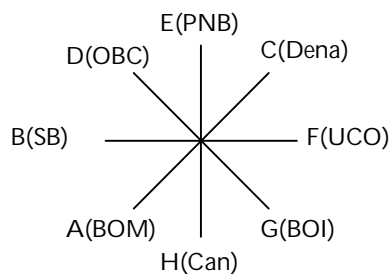
6. C

Sol.

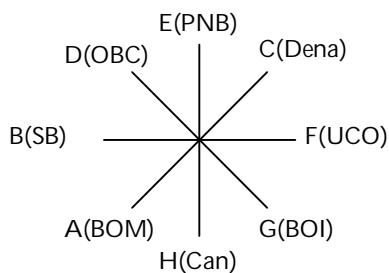


7. C

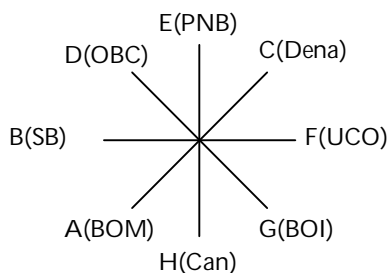
Sol.



8. B  
Sol.

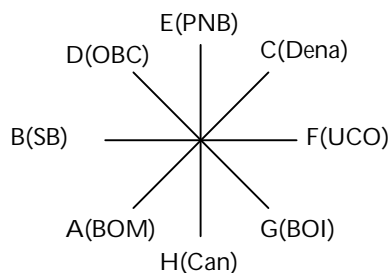


9. D  
Sol.



10. D

Sol.



11. C

Sol.  $\frac{2}{18} + 4 \left[ \frac{1}{18} + \frac{1}{x} \right] = 1 \therefore x = 6$

12. D

Sol. 1<sup>st</sup> man do  $\frac{10}{24} = \frac{5}{12}$  <sup>th</sup> part of the work so he gets  $\frac{5}{12} \times 480 = \text{Rs } 200$

2<sup>nd</sup> man do  $\frac{10}{40} = \frac{1}{4}$  <sup>th</sup> part of the work so he gets  $\frac{1}{4} \times 480 = \text{Rs } 120$

Since the two men earned = Rs 200 + 120 = 320

$\therefore$  Balance for boy = 480 - 320 = 160

13. D

Sol. A = 20 days  $\therefore$  B = 30 days

Two days work =  $\frac{1}{20} + \frac{1}{30} = \frac{1}{12}$

$\therefore$  24 days work = 1

14. A  
 Sol. Let A = produce x pieces, then B = 2x, C = 3x/4 and D = x/4.  
 So  $8 \left[ x + 2x + \frac{3x}{4} + \frac{x}{4} \right] = 256 \therefore x = 8$  So B =  $16 \times 8 = 128$
15. D  
 Sol. A can eat 6 apples in 10 days  
 B can eat 15 apples in 10 days.  
 So, 6 + 15 in 21 days.
16. A  
 Sol. All number are raised to the power 4 of some one
17. D  
 Sol. Digits of a number follow some pattern  
 i.e. – 324 → 234  
 213 123 etc.
18. B  
 Sol. Reverse of digits formed a squared number
19. B  
 Sol. Sum of 1<sup>st</sup> and last digit + 1 = middle digits
20. B  
 Sol. Cube of first digit – 1 = remaining number
21. A  
 Sol.  $\frac{x}{40} + \frac{36}{60} = 1 \Rightarrow \frac{x}{40} + \frac{3}{5} = 1 \Rightarrow \frac{x}{40} = \frac{2}{5} \therefore x = 16$
22. A  
 Sol.  $\frac{3}{20} + \frac{2}{25} - \frac{4}{40} - \frac{5}{50} = \frac{3}{100} \therefore 33\frac{1}{3}$
23. B  
 Sol.  $\frac{1}{20} + \frac{1}{25} - \frac{1}{40} - \frac{x}{50} = \frac{1}{40} \Rightarrow x = 2$
24. A  
 Sol. pipes A and B take 16/3 and 16 hrs to fill 2/3<sup>rd</sup> part of tank, so for 2/3<sup>rd</sup> part = 1/16 + 3/16 = 1/4 = 4 hrs.
25. A  
 Sol. Part of cistern filled by three pipes in an hour  

$$= \frac{1}{3} + \frac{1}{5} - \frac{1}{2} = \frac{1}{30}$$
 Hence, the cistern will be filled in 30 hours.
26. D  
 Sol. Now A has to cover 600 m and B 750 m. In the time B covers 750 mt, A would have covered (2/3) × 750 = 500 m

27. A  
 Sol. A runs = 1600 m, B runs = 1600 – 160 = 1440 m and C runs = 1600 – 340 = 1260 m.  
 When B runs 1600 m, C would have run  $\frac{1260 \times 1600}{1440} = 1400$ . Hence B beats C by 200 m.
28. B  
 Sol. Let the speed of the water current be x kmph  
 $\therefore \frac{24}{10+x} + \frac{24}{10-x} = 5 \Rightarrow x = 2$  kmph
29. B  
 Sol. Let B's age is = x so A's age is 2x  
 So,  $3x - 36 = \frac{1}{2}3x \Rightarrow x = 24 \therefore$  A's age is 48
30. A  
 Sol.  $3x + 4y + 5z = 75$  ... (i)  
 $6x + 7y + 10z = 138$  ... (ii)  
 by elimination  $y = 12$   
 $\therefore 3x + y + 5z = 27 + 12 = 39$  Rs
31. C  
 Sol. By observation
32. B  
 Sol. By observation
33. C  
 Sol. By observation
34. B  
 Sol. By observation
35. D  
 Sol. By observation
36. D  
 Sol. Ratio of Hindus =  $\frac{24}{32} = \frac{3}{4}$  th part
37. B  
 Sol. Graduate population of Mehiyan = 9% + 16% = 24 % =  $\frac{1}{4}$  th
38. C  
 Sol. In first group Hindi students = 20  
 Eco students = 30  
 In the second group Hindi students = 20  
 History students = 20
39. C  
 Sol. Number of students playing cricket = 30

40. D  
Sol. Taste (sweet) –  $Z > U > V > Y > X > W$   
Effectiveness (deadly) –  $X > Y > U > W > Z > V$
41. D  
Sol. Taste (sweet) –  $Z > U > V > Y > X > W$   
Effectiveness (deadly) –  $X > Y > U > W > Z > V$
42. D  
Sol. Taste (sweet) –  $Z > U > V > Y > X > W$   
Effectiveness (deadly) –  $X > Y > U > W > Z > V$
43. A  
Sol. Taste (sweet) –  $Z > U > V > Y > X > W$   
Effectiveness (deadly) –  $X > Y > U > W > Z > V$
44. B  
Sol. Taste (sweet) –  $Z > U > V > Y > X > W$   
Effectiveness (deadly) –  $X > Y > U > W > Z > V$
45. D  
Sol. Taste (sweet) –  $Z > U > V > Y > X > W$   
Effectiveness (deadly) –  $X > Y > U > W > Z > V$
46. D  
Sol. Both the conclusion are not related to the statement.  
Hence, neither I nor II follows.
47. D  
Sol. The use of term 'All' in conclusion I maker it invalid. Conclusion II does not express the inherent meaning of the statement.
48. A  
Sol. Only conclusion I follows because funding along with other factors can improve quality of education but funding alone can't guarantee the enhancement of quality of education.
49. D  
Sol. None of the conclusions follows the statement.
50. D  
Sol. In conclusion I term 'All' is suitable and In II nothing is said about the evening walks in statement.

**FIITJEE****TARGET NTSE-2017-18****ANSWERS****PART TEST – 2****ENGLISH LANGUAGE TEST****(Paper – 2)****CODE : 1005****921 FIITJEE students qualified in (2016-17) for NTSE Stage II****ALL INDIA OPEN TEST SERIES**

| Q. No. | ANSWERS | Q. No. | ANSWERS |
|--------|---------|--------|---------|
| 1.     | D       | 30.    | B       |
| 2.     | C       | 31.    | A       |
| 3.     | D       | 32.    | C       |
| 4.     | B       | 33.    | A       |
| 5.     | B       | 34.    | A       |
| 6.     | D       | 35.    | B       |
| 7.     | B       | 36.    | C       |
| 8.     | A       | 37.    | D       |
| 9.     | C       | 38.    | D       |
| 10.    | D       | 39.    | C       |
| 11.    | A       | 40.    | D       |
| 12.    | B       | 41.    | A       |
| 13.    | C       | 42.    | B       |
| 14.    | D       | 43.    | C       |
| 15.    | A       | 44.    | D       |
| 16.    | A       | 45.    | B       |
| 17.    | B       | 46.    | D       |
| 18.    | C       | 47.    | C       |
| 19.    | C       | 48.    | A       |
| 20.    | A       | 49.    | B       |
| 21.    | C       | 50.    | C       |
| 22.    | A       |        |         |
| 23.    | D       |        |         |
| 24.    | B       |        |         |
| 25.    | A       |        |         |
| 26.    | B       |        |         |
| 27.    | C       |        |         |
| 28.    | D       |        |         |
| 29.    | B       |        |         |



**FIITJEE****TARGET NTSE-2017-18****ANSWERS, HINTS & SOLUTIONS****PART TEST – 2****SAT****(Paper – 3)****CODE : 1006****921 FIITJEE students qualified in (2016-17) for NTSE Stage II****ALL INDIA OPEN TEST SERIES**

| Q. No. | ANSWERS | Q. No. | ANSWERS | Q. No. | ANSWERS | Q. No. | ANSWERS |
|--------|---------|--------|---------|--------|---------|--------|---------|
| 1.     | B       | 31.    | A       | 61.    | B       | 91.    | D       |
| 2.     | C       | 32.    | B       | 62.    | A       | 92.    | D       |
| 3.     | C       | 33.    | C       | 63.    | C       | 93.    | B       |
| 4.     | A       | 34.    | A       | 64.    | B       | 94.    | A       |
| 5.     | C       | 35.    | B       | 65.    | B       | 95.    | B       |
| 6.     | C       | 36.    | A       | 66.    | D       | 96.    | A       |
| 7.     | A       | 37.    | C       | 67.    | A       | 97.    | C       |
| 8.     | C       | 38.    | B       | 68.    | C       | 98.    | D       |
| 9.     | C       | 39.    | B       | 69.    | B       | 99.    | D       |
| 10.    | B       | 40.    | D       | 70.    | B       | 100.   | C       |
| 11.    | A       | 41.    | A       | 71.    | A       |        |         |
| 12.    | B       | 42.    | B       | 72.    | D       |        |         |
| 13.    | C       | 43.    | B       | 73.    | C       |        |         |
| 14.    | B       | 44.    | C       | 74.    | C       |        |         |
| 15.    | B       | 45.    | B       | 75.    | B       |        |         |
| 16.    | D       | 46.    | C       | 76.    | C       |        |         |
| 17.    | B       | 47.    | D       | 77.    | A       |        |         |
| 18.    | B       | 48.    | B       | 78.    | C       |        |         |
| 19.    | B       | 49.    | A       | 79.    | C       |        |         |
| 20.    | A       | 50.    | B       | 80.    | B       |        |         |
| 21.    | D       | 51.    | B       | 81.    | B       |        |         |
| 22.    | A       | 52.    | A       | 82.    | B       |        |         |
| 23.    | C       | 53.    | D       | 83.    | C       |        |         |
| 24.    | B       | 54.    | C       | 84.    | D       |        |         |
| 25.    | A       | 55.    | C       | 85.    | D       |        |         |
| 26.    | B       | 56.    | A       | 86.    | B       |        |         |
| 27.    | C       | 57.    | A       | 87.    | A       |        |         |
| 28.    | C       | 58.    | C       | 88.    | B       |        |         |
| 29.    | A       | 59.    | C       | 89.    | D       |        |         |
| 30.    | D       | 60.    | B       | 90.    | A       |        |         |

## HINTS & SOLUTIONS

1. B

Sol. Current in same direction in two different wires produces attracting effect.

$F_{net}$  is attractive.

2. C

Sol. Because of mutual attraction.

3. C

Sol. A moving charge produces both magnetic as well as electric field.

4. A

Sol. When the angle between the magnetic field and velocity of charged particle is  $0^\circ$ , then force is also zero.

5. C

Sol. Because AB and DC have current in same direction, also AD and BC have current in same direction and current in all four arms is equal.

6. C

Sol.  $B = \frac{\mu_0 i}{4\pi l} (\sin \alpha + \sin \beta), \alpha = 0^\circ, \beta = 45^\circ$

7. A

Sol. Methane ( $\text{CH}_4$ )

8. C

Sol. Glass sheet prevents the heat escape from the solar cooker.

9. C

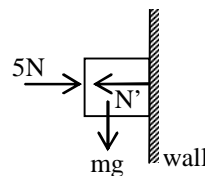
Sol.  $a = \frac{F}{m}, v = \sqrt{2as}$

10. B

Sol.  $f_{\max} = \mu N'$ , for vertical equilibrium,

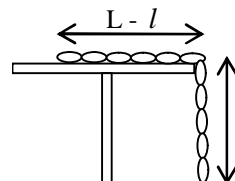
$$f = mg = 0.98N < f_{(\max)}$$

$N' \rightarrow$  Normal Reaction,  $N \rightarrow$  Newton



11. A

$$\begin{aligned} \text{Sol. } g \cdot \frac{m}{L} &= \mu \frac{m}{L} (L-l) g \Rightarrow l = \left( \frac{\mu}{\mu+1} \right) L \\ &= \frac{0.5}{1.5} \times 1 = \frac{1}{3} m \end{aligned}$$

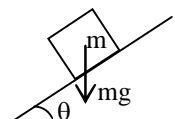


12. B

Sol. If  $a = 0$ , the T is uniform

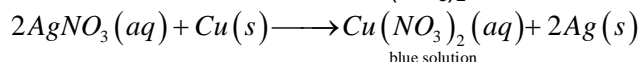
$$T = 4\mu g \text{ and } F = T + 2\mu g$$

13. C  
 Sol. For constant velocity,  $a = 0$   
 contact force =  $mg$   
 because friction and normal reaction balances the weight of the body



14. B  
 Sol.  $4 = k(l_1 - l)$  and  $5 = k(l_2 - l)$   
 $k = \frac{1}{l_2 - l_1}$ ,  $9 = k(l_3 - l)$  and  $l = (5l_1 + 4l_2)$   
 $l_3 = 5l_2 - 4l_1$

15. B  
 Sol. Since Cu is more reactive than silver. Copper displaces Ag from  $AgNO_3$  solution and the solution turns blue due to the formation of  $Cu(NO_3)_2$

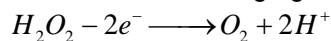


16. D  
 Sol. In the above reaction  $Br_2$  is reduced to  $Br^-$  and oxidized to  $BrO_3^-$ .

17. B  
 Sol. Mg gets oxidized into its corresponding salt in these reactions.  
 $Mg + 2HCl \longrightarrow MgCl_2 + H_2 \uparrow$

18. B  
 Sol. Balanced equation is  
 $8KMnO_4 + 3NH_3 \longrightarrow 8MnO_2 + 3KNO_3 + 5KOH + 2H_2O$

19. B  
 Sol. Reducing agents itself undergo oxidation (loss of electrons). Hence in following two reactions,  $H_2O_2$  acts as reducing agent.



20. A  
 Sol.  $H^+$  ion becomes  $10^{-7}$  from  $10^{-5}$ .  
 $\therefore$  pH of the solution becomes 7 i.e. neutral solution.

21. D  
 Sol.  $[OH^-]$  of M/10 NaOH =  $10^{-1}$  M  
 $\therefore$  pOH = 1  
 $\therefore$  pH of M/10 NaOH = 13 i.e. maximum amongst all given above.

22. A  
 Sol.  $[H^+]$  which is  $10^{-5}$  is changed to  $10^{-2}$ . Therefore  $[H^+]$  will increase 1000 times.

23. C  
 Sol. Bleaching powder – Decolourisation  
 Baking soda – Antacid  
 Washing soda – Preparation of glass  
 Sodium chloride – Production of  $H_2$  and  $Cl_2$

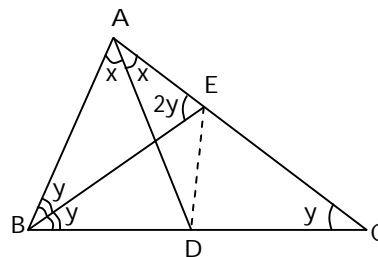
24. B  
Sol. Some metal oxides (like  $\text{Na}_2\text{O}$ ,  $\text{CaO}$  etc) react with water to form metal hydroxides (bases) only and not salt and acid.
25. A  
Sol. The balanced chemical equation is  
$$2\text{MnO}_4^- + 5\text{C}_2\text{O}_4^{2-} + 16\text{H}^+ \longrightarrow 2\text{Mn}^{+2} + 10\text{CO}_2 + 8\text{H}_2\text{O}$$
$$x = 2, y = 5, z = 16$$
26. B  
Sol. Lithium reacts with hydrogen and gets oxidized to lithium hydride. Hydrogen itself gets reduced in this process.
27. C  
Sol. Number of moles of  $\text{H}^+$  ions in 250 ml =  $\frac{10^{-3}}{4} \times 6.023 \times 10^{23} = 1.506 \times 10^{20}$
28. C  
Sol. Areolar is not a type of epithelium.
29. A  
Sol. Epithelial forms the thin surface for gas exchange.
30. D  
Sol. B-Lymphocytes produce antibodies.
31. A  
Sol. Macrophages are phagocytic cell.
32. B  
Sol. Aldosterone helps in  $\text{Na}^+$  and water reabsorption.
33. C  
Sol. Correct sequence is Pia mater – Arachnoid – Dura mater
34. A  
Sol. In an axon nerve impulse travels away from cyton
35. B  
Sol.  $\text{Na}^+$  maintains depolarization in axon.
36. A  
Sol. Adrenal gland releases adrenalin hormone which is a stress hormone.
37. C  
Sol. F.W. Went isolated Auxin.
38. B  
Sol. Cow pox is a viral disease.
39. B  
Sol. Aphids attack mustard.

40. D

Sol. Kinetin or cytokinin is used for induction of shoot in callus.

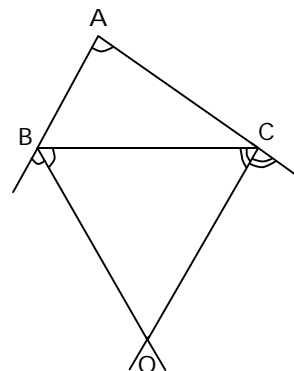
41. A

Sol. In  $\triangle BEC$   
 $\angle BCE = \angle CBE = y$   
 $\Rightarrow BE = EC$   
 $\triangle ABE \cong \triangle DCE$  (SAS criterion of congruency)  
 $\Rightarrow AE = DE$  (CPCT)  
 $\Rightarrow \angle ADE = \angle DAE = x$   
 Also,  $\angle BEA = 2y$   
 and  $\angle AEB = \angle DEC = 2y$  (CPCT)  
 In  $\triangle ADC$ ,  $x + y = \angle ADB$   
 In  $\triangle DEC$ ,  $y + 2y = \angle EDB$   
 $\Rightarrow x + (x + y) = 3y$   
 $x = y$   
 $\angle A + \angle B + \angle C = 180^\circ$  (angle sum prop.)  
 $\Rightarrow 5x = 180^\circ$   
 $x = 36^\circ$   
 $\Rightarrow \angle BAC = 2x = 72^\circ$



42. B

Sol. In  $\triangle ABC$   
 $x + \angle B + \angle C = 180^\circ$   
 $\angle B + \angle C = 180^\circ - x$   
 In  $\triangle BOC$   
 $\frac{180^\circ - \angle C}{2} + \frac{180^\circ - \angle B}{2} + \angle O = 180^\circ$   
 $\angle O = \frac{\angle B + \angle C}{2}$   
 $\angle O = 90^\circ - \frac{x}{2}$



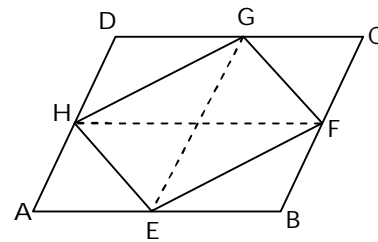
43. B

Sol. Let sides be  $4x$ ,  $6x$  and  $8x$   
 $\therefore$  Perimeter =  $4x + 6x + 8x$   
 $18x = 54$   
 $x = 3$   
 $1^{\text{st}}$  side = 12 units =  $a$   
 $2^{\text{nd}}$  side = 18 units =  $b$   
 $3^{\text{rd}}$  side = 24 units =  $c$   
 Semi-perimeter =  $S = \frac{a+b+c}{2} = 27$  units  
 Area =  $\sqrt{S(S-a)(S-b)(S-c)}$   
 $= \sqrt{27(15)(9)(3)} = \sqrt{3^3 \times 3 \times 5 \times 3^2 \times 3} = \sqrt{3^7 \times 5}$   
 $= 27\sqrt{15}$  square units

44. C

Sol. Area ( $\triangle CGF$ ) =  $\frac{1}{8}$  area (parallelogram ABCD)

$$a = \frac{1}{8}$$



45. B

Sol. Area of square of side  $x = x^2$

Area of rhombus of side  $x$  inclined at  $30^\circ = \frac{1}{2}x^2$

Ratio of area of square to area of rhombs = 2 : 1

46. C

Sol.  $\triangle ABQ \sim \triangle ACR$

$$\Rightarrow \frac{AB}{AC} = \frac{z}{y}$$

Also  $\triangle CQB \sim \triangle CPA$

$$\Rightarrow \frac{BC}{AC} = \frac{z}{x}$$

$AB = AC - BC$

$$\Rightarrow \frac{AC - BC}{AC} = \frac{z}{y}$$

$$1 - \frac{BC}{AC} = \frac{z}{y}$$

$$1 = z \left( \frac{1}{x} + \frac{1}{y} \right)$$

$$\text{or } \frac{1}{z} = \frac{1}{x} + \frac{1}{y}$$

47. D

Sol. Let the age of father be  $x$  years

age of elder son be  $y$  years

age of younger son be  $z$  years

**1<sup>st</sup> condition**

$$x = 2y \quad \dots (i)$$

**2<sup>nd</sup> condition**

$$x + 10 = 3(z + 10) \quad \dots (ii)$$

**3<sup>rd</sup> condition**

$$y - z = 15 \quad \dots (iii)$$

solving (i), (ii) and (iii)

we get  $x = 50$  years.

48. B

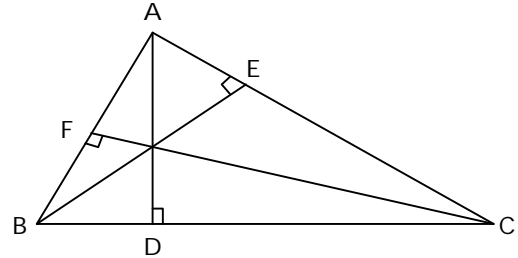
Sol.  $\frac{x}{2} + \frac{x}{4} + \frac{x}{5} + 7 = x$

$$\frac{x}{20} = 7$$

$$\Rightarrow x = 140$$

49. A

Sol. In  $\triangle ADC$   
 $\angle D > \angle C$   
 $\therefore AC > AD$   
 Similarly,  $AB > AD$   
 $\therefore (AB + AC) > 2AD$   
 $(AB + BC) > 2BE$   
 $(AC + BC) > 2CF$   
 $\Rightarrow AB + BC + CA > AD + BE + CF$



50. B

Sol. By angle bisector theorem

$$\frac{BL}{LC} = \frac{AB}{AC}$$

$$\frac{4}{3} = \frac{AB}{7.5}$$

$$AB = 10 \text{ cm}$$

51. B

Sol. Since triangles BXO and CXK are similar

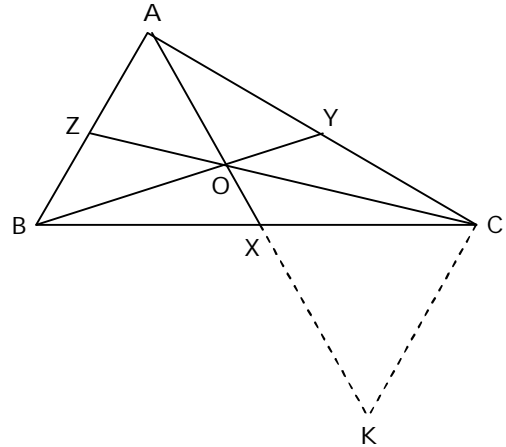
$$\therefore \frac{OX}{XK} = \frac{BX}{CX} = 1$$

$$\Rightarrow OX = XK$$

Also  $\frac{AO}{OX} = \frac{AO}{XK} = \frac{2}{1}$

Hence,  $AK = 2AO$

$$\Rightarrow AO = \frac{AK}{2}$$



52. A

Sol. Drop perpendiculars ADE and PST from A and P to other lines m and n.

$$\triangle ABD \sim \triangle ACE$$

$$\frac{AB}{AC} = \frac{AD}{AE} \quad \dots (i)$$

$$\triangle PSQ \sim \triangle PTR$$

$$\frac{PQ}{PR} = \frac{PS}{PT} \quad \dots (ii)$$

Since  $AD = PS$ ,  $AE = PT$

$$\therefore \frac{AB}{AC} = \frac{PQ}{PR}$$

Applying dividendo

$$\frac{AB}{AC-AB} = \frac{PQ}{PR-PQ}$$

or  $\frac{AB}{BC} = \frac{PQ}{QR}$

53. D

Sol. Let number of sums solved correctly be x

$$3x - 2(30 - x) = 40$$

$$\Rightarrow x = 20$$

54. C

Sol. Area ( $\triangle DEF$ ) =  $\frac{1}{2} \times DF \times FM = \frac{1}{2} \times 3 \times 8 = 12 \text{ cm}^2$

$$\therefore \text{ar}(\triangle ABC) = 4 \times \text{area}(\triangle DEF) = 48 \text{ cm}^2$$

55. C

Sol. Let number of cows be x

number of hens be y

Acc. to question

$$4x + 2y = 92$$

$$\Rightarrow 2x + y = 46 \quad \dots (i)$$

$$\text{and } x + y = 29 \quad \dots (ii)$$

subtracting (ii) from (i)

$$\text{we get } x = 17$$

56. A

Sol.  $\angle B + \angle A = 110^\circ \quad \dots (i)$

$$\angle B - \angle A = 10^\circ \quad \dots (ii)$$

Adding (i) and (ii)

$$\text{we get } \angle B = 60^\circ$$

subtracting (ii) from (i)

$$\text{we get } \angle A = 50^\circ$$

$$\angle A + \angle B + \angle C = 180^\circ$$

$$\Rightarrow \angle C = 70^\circ$$

Thus  $\angle C > \angle B$

and  $\angle B > \angle A$

$$\therefore AB > AC$$

and  $AC > BC$

Hence, AB is longest side and BC is shortest side.

57. A

Sol.  $\triangle ABC$  is a right triangle at B. medians are AE, BF, CD.

$$AE^2 = AB^2 + BE^2$$

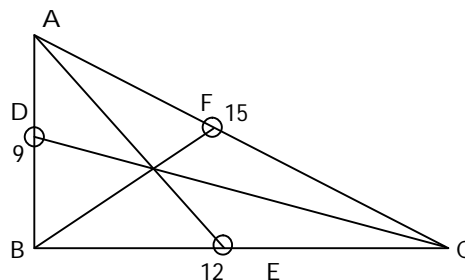
$$AE^2 = 81 + 36$$

$$AE^2 = 117 \text{ cm}$$

$$CD^2 = CB^2 + BD^2$$

$$CD^2 = 144 + 20.25$$

$$CD^2 = 164.25 \text{ cm}$$





$$BF = \frac{1}{2} AC$$

$$BF = 7.5$$

$$BF^2 = 56.25 \text{ cm}$$

$$\therefore AE^2 + CD^2 + BF^2 = 337.50 \text{ cm}$$

58. C

Sol. Let speed of water flowing be  $x$  km/hr.

While going upstream, speed of boat =  $(18 - x)$  km/hr.

While coming downstream, speed of boat =  $(18 + x)$  km/hr.

ATQ

$$\frac{24}{18-x} - \frac{24}{18+x} = 1$$

$$\Rightarrow x^2 + 48x - 324 = 0$$

$$\Rightarrow (x-6)(x+54) = 0$$

$$\Rightarrow x = 6$$

59. C

Sol.  $AC = 2$

$$BC = 1$$

$$AB^2 = AC^2 - BC^2$$

$$\Rightarrow AB = \sqrt{3}$$

$$\text{ar}\Delta ABC = \frac{\sqrt{3}}{2}$$

$$\text{Also, ar}\Delta ABC = \frac{1}{2} \cdot BD \cdot AC = \frac{BD}{2} \cdot 2 = BD$$

$$\Rightarrow BD = \frac{\sqrt{3}}{2}$$

Now for  $\Delta ABC$  and  $\Delta BDF$

$$\angle BFD = \angle ABC = 90^\circ$$

$$\angle DBF = \angle BAC = \theta$$

$$\therefore \Delta ABC \sim \Delta BFD$$

$$\Rightarrow \frac{AB}{BF} = \frac{BC}{DF} = \frac{AC}{BD}$$

$$\frac{\sqrt{3}}{BF} = \frac{1}{DF} = \frac{2}{BD}$$

$$BF = \frac{3}{4}, DF = \frac{\sqrt{3}}{4}$$

$\therefore$  area of rectangle with  $BD$  as its diagonal

$$= BF \cdot DF$$

$$= \frac{3\sqrt{3}}{16}$$

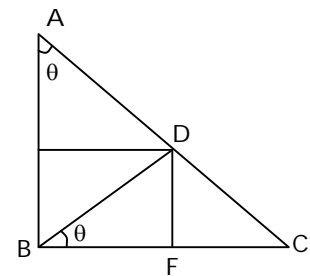
60. B

Sol. Let  $x, y, z$  be the lengths of the sides such that  $z = 21x$

since  $x + y > z$

$$\Rightarrow y > 20x$$

$$\therefore 2004 = x + y + z > 42x$$



$$\Rightarrow x < \frac{2004}{42} < 48$$

$$\Rightarrow x < 48$$

$$\text{Also, } x + z > y$$

$$\Rightarrow 2(x + z) > x + y + z$$

$$x > \frac{2004}{44}$$

$$\therefore x > 45$$

$$x = 46 \text{ or } 47$$

$$\text{when } x = 46,$$

$$y = 966, z = 992$$

$$\text{when } x = 47,$$

$$y = 987, z = 970$$

61. B

Sol. Flying shuttle was a mechanical device for weaving

62. A

Sol. Production process of cloth in order is carding, twisting, spinning and rolling.

63. C

Sol. Masulipattan port had links with South-East Asian countries.

64. B

Sol. The first Jute mill was established in India in 1855.

65. B

Sol. Silver material attracted the Europeans to conquer Peru.

66. D

Sol. Most of indentured labourers in Africa came from all of these.

67. A

Sol. Great depression started in 1929.

68. C

Sol. Bretton woods conference held in New Hampshire, USA.

69. B

Sol. "Edo" was the earlier name of Tokayo.

70. B

Sol. The Grimm brothers of Germany published Folktales.

71. A

Sol. Tom Jones is one of the novel of Henry Fielding.

72. D

Sol. None of these

73. C

Sol. Laterite soil is very useful for the cultivation of tea and coffee.

74. C  
Sol. 43% of plains is there in India.
75. B  
Sol. Rocks are not an example of a biotic resource.
76. C  
Sol. In Orissa the simplipal bio reserve is located.
77. A  
Sol. Jamun is used to control diabetes.
78. C  
Sol. Musk deer is found in the forest of Himalayan region.
79. C  
Sol. Mangrove vegetation in India is most extensive in Sunderbans.
80. B  
Sol. The first multi-purpose project of India was Damodar Valley.
81. B  
Sol. Rooftop rainwater harvesting system in Rajasthan is known as Tankas.
82. B  
Sol. Damodar river is known as the "River of Sorrow".
83. C  
Sol. In eastern part of Belgium, the German speaking people live.
84. D  
Sol. Sri Lanka win its independence from England.
85. D  
Sol. Australia is not holding together type of federation.
86. B  
Sol. According to the constitution, the use of English for official purposes was to stop in 1965.
87. A  
Sol. Political expression of social division may lead to violence.
88. B  
Sol. The percentage of protestant Christians in Northern Ireland is 53.
89. D  
Sol. Social difference arise due to difference in All the above.
90. A  
Sol. Homogenous society refers to similar kind of people.
91. D  
Sol. In India no official religion.
92. D  
Sol. Women in India are discriminated in all the above.

93. B  
Sol. The representation of women in state legislature assemblies is less than 5%.
94. A  
Sol. Bihar had the least per capita income in 2011-12.
95. B  
Sol. In 2012, Infant Mortality Rate in Kerala was 12.
96. A  
Sol. Human Development Report is published by the UNDP.
97. C  
Sol. Literacy rate of Bihar in 2011 is 63.82%.
98. D  
Sol. All of them is included in tertiary sector.
99. D  
Sol. Right to work has been implemented in India in all districts.
100. C  
Sol. The largest producing sector in 2010-11 in India is tertiary sector.