

**HINTS AND SOLUTIONS**

**TEST CODE: NIMCET – 207**

1. (a)  $5 \cos A + 4 = 0 \Rightarrow \cos A = -4/5$

$\sin A = 3/5; \tan A = -3/5$

Sum of the roots  $-3/20 = \sin A + \tan A$

Product  $= -9/20 = \sin A \tan A$

2. (d)

3. (b)  $a \sim \begin{vmatrix} -1 & 2 & 5 \\ 0 & 0 & a+6 \\ 0 & 0 & a+6 \end{vmatrix}$

$R_2 \rightarrow R_2 + 2R_1$   
 $R_3 \rightarrow R_3 + R_1$

$\sim \begin{vmatrix} -1 & 2 & 5 \\ 0 & 0 & a+6 \\ 0 & 0 & 0 \end{vmatrix}$

$R_3 \rightarrow R_3 - R_2$

$\therefore \text{rank } A = 2 \text{ if } a \neq -6$

4. (c)  $-\frac{1}{2} + i \frac{\sqrt{3}}{2} = \cos 2\frac{\pi}{3} + i \sin 2\frac{\pi}{3}$

5. (c)  $(r+1)\text{th term in expansion of } \left(\frac{3}{2}x^2 - \frac{1}{3x}\right)^9$

$= 9C_r (-1)^r \frac{3^{9-2r}}{2^{9-r}} x^{18-3r}$

Req. sum = coeff. of  $x^0$  + coeff.  $x^{-1}$  + (coeff.  $x^{-3} \times 2$ ) =  $\frac{17}{54}$

6. (a)

7. (b)  $|\vec{c} - \vec{a}|^2 = 8 = |\vec{c}| = 1 \therefore |(\vec{a} \times \vec{b}) \times \vec{c}| = 3/2$

8. (a)  $a^{1/x} = b^{1/y} = c^{1/z} = k \Rightarrow a = k^x$

$b = k^y \Rightarrow k^{2y} = k^{x+z}$  [Since  $a, b, c$  are in G. P.]

$c = k^z \Rightarrow x + z = 2y \Rightarrow x, y, z \text{ are in A.P.}$

9. (c)

10. (a)

11. (c)  $1 = 4 \int_0^{\pi/2} \sin^3 \theta d\theta = 8/3$

12. (c) Let tangents at  $A$  and  $B$  to the ellipse meet at  $P(\alpha, \beta)$ . Thus, equation  $AB$  is  $\frac{x\alpha}{9} + \frac{y\beta}{4} = 1$  (1) (chord

of contact of tangents from  $P$ ) But given  $y - 2x = 1$  (2)

(1) and (2) are the same, straight line

$\therefore \frac{\alpha}{-18} = \frac{\beta}{4} = 1 \Rightarrow \alpha = -18, \beta = 4$

13. (b)

14. (d) Scalar triple product

15. (b)

16. (a) Standard Result

17. (c) Result

18. (b)  $\lambda = \left| \frac{a}{b} \right| = \frac{\sqrt{4+9+36}}{\sqrt{4+4+1}} = \frac{7}{3}$

19. (b) Let  $\theta = \cos^{-1}(4/5)$

$\alpha = \tan^{-1}(2/3)$  Use  $\tan(\theta + \alpha) = \frac{\tan \theta + \tan \alpha}{1 - \tan \theta \tan \alpha}$

$\tan(\theta + \alpha) = 17/6$

20. (d)

21. (c) Various possibilities

all distinct  $\rightarrow 4! = 120$

3 alike, one distinct  $\rightarrow = 16$

$$\begin{array}{lll} 2 \text{ alike, } 2 \text{ distinct} & \rightarrow & = 144 \\ 2 \text{ sance, } 2 \text{ some} & \rightarrow & = 6286 \end{array}$$

22. (b)

23. (b)

$$24. (d) Q_3 = 17 \text{ and } Q_1 = 10 \therefore Q.D. = \frac{1}{2}(Q_3 - Q_1) = 3.5$$

$$25. (a) \int_0^{1.5} [x^2] dx = \int_0^1 [x^2] dx + \int_1^{\sqrt{2}} [x^2] dx + \int_{\sqrt{2}}^{1.5} [x^2] dx$$

26. (b)

27. (a) Condition for general equation of 2<sup>nd</sup> degree to represent a pair of lines.

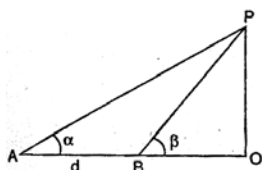
28. (a)

$$29. (b) np - npq = \frac{5}{9}; n = 5$$

$$\Rightarrow 5p(1-q) = \frac{5}{9} \Rightarrow p^2 = \frac{1}{9} \Rightarrow p = \frac{1}{3}, q = \frac{2}{3}$$

30. (a) Euler's theorem

31. (a)



Let height of tower = h

Then d = AB = OA - OB

$$= h(\cot \alpha - \cot \beta) = \frac{h \sin(\beta - \alpha)}{\sin \alpha \cdot \sin \beta}$$

32. (c)

$$33. (a) \text{adj}(\text{adj } A^2) = |A^2|^{2-2} \cdot A^2 = A^2$$

(Using  $\text{adj}(\text{adj } B) = |B|^{n-2} \cdot B$ )

$$|\text{adj} \{ \text{adj} \{ \text{adj } A^2 \} \}| = |\text{adj } A^2| = |A^2|^{2-1} = |A^2| = |A|^2 = 4.$$

$$34. (b) \text{ Let } (a, b) \in R \Rightarrow (b, a) \in R^{-1}.$$

$$\text{But } R^{-1} = R \Rightarrow (b, a) \in R.$$

$$35. (d) \sec \theta = \sqrt{2}(1 - \tan \theta)$$

$$\Rightarrow \sec^2 \theta = 2(1 + \tan^2 \theta - 2 \tan \theta)$$

$$\Rightarrow \tan^2 \theta - 4 \tan \theta + 1 = 0 \Rightarrow (\tan \theta - 2)^2 = 3$$

$$36. (a) 4/e^2 \therefore f'(x) = 0 \text{ for } x = \frac{1}{e^2}; f''(1/e^2) < 0$$

37. (d) Locus of point of intersection of perpendicular tangents to the parabola is directrix.

$$38. (b) \vec{a} + \vec{b} + \vec{c} = 0 \Rightarrow (\vec{a} + \vec{b} + \vec{c}) \cdot (\vec{a} + \vec{b} + \vec{c}) = 0$$

$$\Rightarrow |\vec{a}|^2 + |\vec{b}|^2 + |\vec{c}|^2 + 2(\vec{a} \cdot \vec{b} + \vec{b} \cdot \vec{c} + \vec{c} \cdot \vec{a}) = 0$$

$$\Rightarrow \vec{a} \cdot \vec{b} + \vec{b} \cdot \vec{c} + \vec{c} \cdot \vec{a} = -\frac{3}{2} [\because |\vec{a}| = |\vec{b}| = |\vec{c}| = 1]$$

39. (c) If  $x_1, x_2, \dots, x_k$  be k variables and  $x = x_1 \cdot x_2 \cdot \dots \cdot x_k$ , then  $\log x = \log x_1 + \log x_2 + \dots + \log x_k$

$$\Rightarrow \Sigma \log x = \Sigma \log x_1 + \Sigma \log x_2 + \dots + \Sigma \log x_k$$

$$\Rightarrow \frac{1}{n} \Sigma \log x = \frac{1}{n} \Sigma \log x_1 + \frac{1}{n} \Sigma \log x_2 + \dots + \frac{1}{n} \Sigma \log x_k$$

$$\Rightarrow \log G = \log G_1 + \log G_2 + \dots + \log G_k$$

$$\Rightarrow G = G_1 G_2 \dots G_k$$

$$40. (a) \text{Coefficient of skewness} = \frac{3(\text{mean} - \text{median})}{\text{S.D}}$$

$$-0.6 = \frac{3(6.5 - 70)}{5.0} \text{S.D.} = 25$$

$$\text{Coeff. of skewness} = \frac{\text{Mean} - \text{Mode}}{\text{S.D.}}$$

$$\Rightarrow -0.6 = \frac{65 - \text{mode}}{25} \Rightarrow \text{mode} = 80$$

41. (d)

42. (c)

43. (a)

44. (a) To convert to base 8, we group in 3's  $\because 2^3 = 8$

To convert to base 16, we group in 4's  $\because 2^4 = 16$

$\therefore$  To convert in 32 we require grouping of 5 bits  $2^5 = 32$

$$\begin{array}{ccccccc} 16 & 1 & 4 & 2 & 1 & & \\ 1 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & = 2214716 \\ \leftarrow & & \leftarrow & & \leftarrow & & \leftarrow & & \leftarrow & & \leftarrow & & \leftarrow & & \leftarrow & & \leftarrow & \\ 22 & & 14 & & 7 & & 16 & & & & & & & & & & & \end{array}$$

45. (b) If  $A=25$  &  $B=30$ , then answer to " $A < B$ " is YES, hence  $A=A+2B$  is executed. This gives  $A=25+60=85$ .

Now, the answer to " $A < 20$ " is NO,

hence  $B=B+5 \times A$  is executed. This gives  $B=30+5 \times 85=455$ .

Therefore the output is  $A=85, B=455$ .

**46. (d)** Machine language is made of binary digits which is directly understood by the computer without any need of translator, it is directly executed by CPU.

**47. (a)**

**48. (c)**

**49. (d)**

**50. (d)** If the interrupt is maskable the OS can make it in suspending state & continue with its important work for time being & then can do the interrupt operation.

**51. (b)**

**52. (c)**

**53. (c)**

**54. (c)**

**55. (c)**

**56. (a)** Each time the arrow moves half a side CW and gets inverted and the circle moves half a side CW with the white sector increasing by an angle of  $45^\circ$  CW. To establish the series figure (a) and (b) have to be interchanged.

**57. (b)** The wave pulses reverse their phases in each subsequent step and the dark pulse moves one step upward alternatively. But to establish the series (b) and (d) have to be interchanged.

**58. (a)** The main figure rotates one step ACW in each turn and the dot moves one side CW in each turn and also gets inside and outside the main figure alternatively. But to establish the series figure (a) and (c) have to be interchanged.

**59. (c)** The no. of line segments in the second = product of line segments and no. of sides of closed-ended figure of first.

**60. (c)** The whole figure rotates  $90^\circ$  ACW. The two bottom objects interchanged their places only and the upper two objects interchanged their positions along with change in their size.

**61. (b)** From figure II to I: The lower element rotates by  $135^\circ$  ACW and shifts to top while the upper element rotates by  $45^\circ$  CW and shifts to lower position. The middle element gets reduced in size and doubled and is placed in the middle on the ends of the bar.

**62. (c)**  $\times$  and white are opposite.  $\div$  and U are opposite. O and shaded are opposite.

**63. (d)** Total number of balls in the urn is 25. Chance of drawing a red ball would only be known if the number of red balls in the urn is known.

I: does not tell us how many red balls are there.

II: again does not specify the no. of red balls. Even both together do not give the number of red balls in the urn.

**64. (c)** I: Words spoken =  $50 \times y$ ,  $y$  = no. of min. spoken

II: Words spoken =  $(y + 10)(t - 4)$

Combined:  $50y = (y + 10)(50 - 4)$  ( $\because t = 50$ )

or  $50y = 46y + 460 \Rightarrow 4y = 460$  or  $y = 115 = 1 \text{ hour } 55 \text{ min.}$

**65. (c)** From I: Asha was out for 10 days

or Asha stayed for 20 days

Friend stayed for 30 days; where room rent = Rs  $x$ /day

Proportion of Asha's rent to her friend's rent =  $20x : 30x$

Absolute value of  $x$  is not known.

From II: Asha's friend paid Rs 15

Combined I & II  $\Rightarrow 30x = 15$  or  $x = 0.5$

$\therefore$  Asha paid  $20x = 20 \times 0.5 = \text{Rs } 10$

**66. (b)** From fig. II to I: The outer element of the I rotates  $135^\circ$  ACW while the inner element moves CW by  $90^\circ$  to get the II.

**67. (b)** This pattern is using a reflection transformation. The shape is being reflected in the horizontal plane followed by the vertical plane and then in both planes.

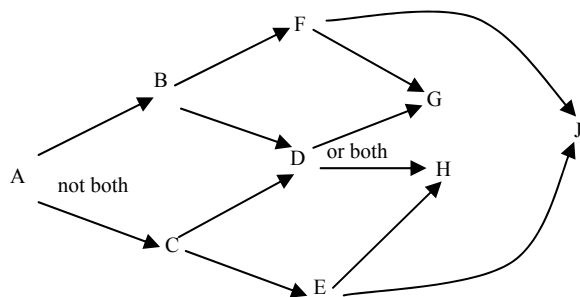
**68. (d)** *Reject 1:* relevant part of the given equation ( $B \# Q \times R$ ) implies that the generation gap between B and R is one, not two. (Note that if R is the grandson of B then the gap between R and B must be two).

*Reject 2:*  $\because$  the symbol between Q and R in the given equation implies that Q is the sister of R. This information does not give any clue regarding the sex of R. (Note that if R is the grandson of B then the notation should represent R as a male.)

*Reject 3:*  $\because$  the generation gap between B and R is only one (one less than required):

	B	+	M	*	D	#	Q	$\times$	R
Generation gap: (+1)	(-1)		(+1)		$\Rightarrow$		+1		
	$\rightarrow$		$\leftarrow$				$\rightarrow$		

**Directions (Q 69 – 72):** Use the diagram given below. Also avoid unsupported assumptions; for example, statement (2) does not mean that F always occurs if B occurs – just that it never occurs without B having occurred. Similarly, statement (1) does not mean that B or C cannot occur without A – just that if A occurs, one of these (but not both) will occur. Finally, statement (3) does not mean that D occurs only this way – it may occur on its own, without B or C, but it will certainly occur if B or C occurs.



**69. (b)** A causes B or C, but not both. In either case, D occurs (III) F and E can occur only if B or C occurs, respectively, so they cannot both occur if A occurs (I, II). The other parts of I and II are consistent: G will occur if F occurs; H will occur if E occurs.

**70. (c)** See statement (2), F may occur if B occurs, but may not (choice A); D will occur if B occurs, but D may cause H instead of G (choice B); G occurs if F occurs and may occur if D occurs, but F need not occur if B occurs, while D can lead to H; so G or H must occur, but both need not occur (choice D); J may not occur even if E or F occurs (choice E).

**71. (c)** If J occurs, E or F must have occurred – statement (5); thus either B or C must have occurred – statement (2), (4). Since E or E, but not both, is required for J, choices A and B are wrong. If E occurs and F does not, G need not occur (choice D). B and C can both occur (if one is not caused by A) but both aren't necessary for J; they can lead to E and F, but one of these is all that is required for J to occur (choice E).

**72. (c)** D may occur without B or C; no cause for A is mentioned (I, II); but F occurs only if B occurs (statement 2) and no other cause is possible (III).

$$73. (b) t_n = \frac{2n}{(2n+1)!} = \frac{(2n+1-1)}{(2n+1)!} = \frac{1}{2n!} - \frac{1}{(2n+1)!}.$$

Put  $n = 1, 2, 3, \dots$

$$\text{Sum } \frac{1}{2!} - \frac{1}{3!} + \frac{1}{4!} - \frac{1}{5!} + \dots = \frac{1}{e}$$

$$(e^{-x} = 1 - x + \frac{x^2}{2!} - \frac{x^3}{3!} + \dots)$$

**74. (a)** The series is  $\times 5 - 1, \times 4 + 2, \times 3 - 3, \times 2 + 4, \times 1 - 5$  and so on.

**75. (b)** The series is  $\times(-3)+1, \times(-2)+2, \times(-1)+3, \times 0+4, \times(+1)+5, \times(+2)+6$  and so on.

$$76. (d) 2^1 = 2; 2^2 = 4; 4^3 = 64 \text{ and } 64^4 = 16777216.$$

### Directions (Q 77 – 80):

77. (d)

78. (d)

B<sub>5</sub> B<sub>2</sub> B<sub>4</sub> B<sub>1</sub> B<sub>6</sub> B<sub>3</sub>  
C<sub>5</sub> C<sub>1</sub> C<sub>6</sub> C<sub>3</sub> C<sub>2</sub> C<sub>4</sub>  
79. (a) 80. (b)

### Directions (Q 81 – 85):

Books	Person
Physics	C
English	A
Chemistry	D
Zoology	F
History	B
Mathematics	E

81. (c)

82. (d)

83. (a)

84. (b)

**85. (d)**  $O < P < M \dots$  (i)  $O < N < P \dots$  (ii)  
From (i) and (ii),  $O < N < P < M$

**86. (d)** Some blues are bills (I)  $\rightarrow$  conversion  $\rightarrow$  Some bills are blues (I). hence conclusion I follows. While III does not follow. Similarly, II follows from the second statement. IV does not follow because of the first statement.

**87. (b)** All doors are matches (A)  $\rightarrow$  conversion  $\rightarrow$  Some matches are doors (I). Hence I follows while II does not necessarily follow. All doors are matches + Some matches are brick = No conclusion. However, since III and IV form a complementary I - E pair, either III or IV follows.

**88. (c)** No book is prize + All prizes are shops = Some shops are not books. Hence I and II do not follow. All prizes are shops (A)  $\rightarrow$  conversion  $\rightarrow$  Some shops are prizes (I). Hence III follows. No book is prize (E)  $\rightarrow$  conversion  $\rightarrow$  No prize is book (E). Hence IV does not follow. But either I or II must be true.

**89. (c)** All cigars are dogs + All dogs are cats = All cigars are cats. Hence II follows. But the conversion of A-type becomes I-type. hence I does not follow. Again, All dogs are cats (A)  $\rightarrow$  conversion  $\rightarrow$  Some cats are dogs (I). Hence III follows while IV does not follow.

**90. (d)** Some big are small + All small are huge = Some big are huge. Hence II follows. IV does not follow from the first statement. Again, All small are huge (A)  $\rightarrow$  conversion  $\rightarrow$  Some huge are small (I). Hence III does not follow. I follows because it is the conversion of II.



**Direction :** Each of the sentences below has one or more blank spaces indicating where a word/words has/have been left out. Choose the appropriate word/words from word/words lettered a to b which means most meaningful.

6. \_\_\_\_\_ caused his leg to be \_\_\_\_\_  
 (a) fracture, cut (b) sepsis, purulent  
 (c) gangrene, amputated (d) disease, vivisected

7. Political \_\_\_\_\_ between the two countries led to the \_\_\_\_\_ of diplomatic relations between them.  
 (a) fiasco, cut (b) barrier, policy  
 (c) friction, severance (d) agreement, cessation

8. The annual festival at the school \_\_\_\_\_ the \_\_\_\_\_ of the children.  
 (a) brought in, acting ability (b) brought up, best  
 (c) brought out, histrionic talents (d) brought forward, theatrical skills

9. In every kind of trouble what is wanted is not emotional \_\_\_\_\_ but \_\_\_\_\_ thinking.  
 (a) cheerfulness, constructive (b) empathy, sound  
 (c) sympathy, creative (d) exhaustion, positive

10. \_\_\_\_\_ is necessary to distinction & uniformity in education tends to produce \_\_\_\_\_ in adult life.  
 (a) wealth, failty (b) honour, variety  
 (c) diversity, mediocrity (d) fame, distinction

11. We \_\_\_\_\_ the family members after expressing our grief at the tragedy.  
 (a) mourned (b) consoled  
 (c) satisfied (d) cheered

12. The doctor was overcome with \_\_\_\_\_ when he came to know the patient had died due to negligence on his part.  
 (a) emotion (b) reality  
 (c) humiliation (d) remorse

**Direction :** Question 13 to 16 a capitalized word is followed by four words lettered A to D. select the word which is most nearly opposite to the capitalized word

13. ILLUMINATE :  
 (a) heat (b) dim  
 (c) brighten (d) radiate

14. CONGOSCENTE  
 (a) tyro (b) expert  
 (c) don (d) savant

15. ADDLE  
 (a) empty (b) knowledgeable  
 (c) muddled (d) worse

16. FATUOUS  
 (a) authentic (b) shrewd  
 (c) factual (d) dull

**Direction :** Question 17 -20 a capitalized pair of words is followed by letters pairs. Select the lettered pair wherein the words have the closest relationship to that of capitalized letter

17. PRIDE : MODESTY : :  
 (a) haughty : humble (b) proud : model  
 (c) guide : traveller (d) adjective : noun

18. EDITOR : WRITER : :  
 (a) arrange : create (b) cut : add  
 (c) prune : append (d) paper : book

19. SPIDER : ARACHNID : :  
 (a) computer : homoroid (b) man : homo  
 (c) kangaroo : marsupial (d) snake : reptile

20. FISH : FRY  
 (a) hen : chick (b) adult : embryo  
 (c) horse : mare (d) shrub : tree

21. SCALES : JUSTICE : :  
 (a) weights : law (b) markets : courts  
 (c) torch : liberty (d) laurel : peace  
 (e) balance : right

22. The population of a town is increased by 10% in a year and then decreased by 10% in the next year. After the second year by what percent is the population more or less than that of 2 years ago?  
 (a) no increase (b) 1 % more (c) 1 % less (d) 10% more

23. Badri can do a piece of work in 10 days. Sriram can do the same work in 8 days. Both work together for 2 days and Badri stops working. How long will it take Sriram to complete the remaining work  
 (a) 18 days (b) 16 days (c) 4.4 days (d) 6 days

24. I had 18 km to reach a place X. After walking a few km at 4 km per hour. I changed my speed to 3 km per hour. If I took 5 hours to reach X, at what distance from X. I changed my speed.  
 (a) 9 km (b) 3 km (c) 12 km (d) 6 km

25. I have to be at a place at 2 p.m. I find that if I walk at 4 km an hour, I can reach the place at 2:05 pm. and if at 5 km an hour. I can reach the place at 1:50 pm. How far I have to go?  
 (a) 4 km (b) 5 km (c) 6 km (d) 1 km

26. A student is required to get 40% marks to pass. He gets 253 marks and fails by 27 marks. The total marks of the exam is

- (a) 600 (b) 500 (c) 700 (d) 800

27. A pipe line of length  $x$  cm into two segments such that the length of one segment is two cm more than three times the length of other segment. Which of the following is the length in cm of the longer segment?

- (a)  $(x+4)/3$  (b)  $(3x+2)/3$  (c)  $(x-2)/4$  (d)  $(3x+2)/4$

28. The smallest angle in degree between the hour and minute needles of a clock when the time is 12 Hr 30 Mt is

- (a) 180 (b) 165 (c) 196 (d) 150

29. In a certain code language the word 'CRIMINAL' is written as ACILMNR. How will the word FEEDBACK be written?

- (a) ABCDEEFK (b) AFBCDEKE  
(c) FKABCDEE (d) FABEEDCK

30. Study the series A and follow the same pattern to complete the series B.

(A) 4, 4, 6, 12, 30, 90, 315

(B) 1, 1, ..., 3, 7.5, ..., 78.75

- (a) 1, 11.5 (b) 1.5, 22.5 (c) 2, 1.5 (d) 3, 7.5

31. The length of a minute hand on a wall clock is 10.5 cm.

The area (in  $\text{cm}^2$ ) swept by the minute hand in 10 minutes is

- (a) 47.75 (b) 52.75 (c) 57.75 (d) 63.250

**Directions (Q. 32 – 35):** Each of the questions given below has one question and two statements marked I and II. You have to decide whether the data provided in the statements are sufficient to answer the questions. Read both statements and give answer number

- (a) If the data in statement I alone is sufficient while the data in statement II alone is not sufficient to answer the question  
(b) If the data in statement II alone is sufficient to answer the question while the data in statement I alone is not sufficient to answer the question  
(c) If data even in both the statement I and II together are not sufficient to answer the question  
(d) If data in both the statement I and II together are needed to answer the question

32. What is the age of Ram?

(I) He is as old as his friend, Ramesh

(II) His father's age is 50 years and he is  $3\frac{1}{3}$  times older than Ram

33. Find the share of A in the profit

(I) The profit of Rs. 600 is to be divided among A, B and C

(II) A gets half of B and C gets the maximum

34. Which is the smaller of the two numbers?

(I) The difference between these two numbers is one-third of the greater number

(II) The sum of these two numbers is 30

35. What is the length of a train?

(I) Speed of the train is 60 km/hr and it crosses a standing man in 12 seconds

(II) The train crosses a running man in 12 seconds at the same speed.

**Directions (Q.36 – 40):** Study the following table carefully and answer the questions given below. Attendance of students in 80 classes of a semester in different papers

Paper	I	II	III	IV	V	VI
Rohit	35	38	57	48	63	64
Kunal	31	75	28	68	65	29
Silpi	74	15	54	53	30	36
Pratik	41	45	37	59	72	69
Ravi	72	64	70	48	47	26
Anil	35	63	59	23	72	40

36. Who among the following attends the max. classes?

- (a) Rohit (b) Pratik (c) Silpi (d) Ravi

37. In which of the following papers average attendance of students is least?

- (a) I (b) II (c) III (d) VI

38. Atleast  $2/5^{\text{th}}$  attendance is required in each paper in the exam. How many students are allowed to appear in the exam?

- (a) 1 (b) 2  
(c) 3 (d) 4

39. What is the average % of classes attendance by Pratik and Silpi?

- (a) 60.93 (b) 62.42 (c) 59.32 (d) 65.32

40. What % more / less classes did Kunal attend than Ravi?

- (a) 7.42 % more (b) 6.46 % less  
(c) 11.32 less (d) 4.51 more

### SOLUTIONS OF Additional Problems

1. (a) 2. (b) 3. (c) 4. (a) 5. (c) 6. (c) 7. (c)  
8. (c) 9. (a) 10. (c) 11. (b) 12. (d) 13. (b) 14. (a)  
15. (b) 16. (b) 17. (a) 18. (a) 19. (b) 20. (a) 21. (c)

$$22. (c) P_{\text{Final}} = P_{\text{initial}} \left(1 + \frac{10}{100}\right) \left(1 - \frac{10}{100}\right)$$

$$\Rightarrow P_F = P_I \left(\frac{11}{10}\right) \left(\frac{9}{10}\right) = \frac{99}{100} P_I$$

$$\Rightarrow P_F = P_I \left(1 - \frac{1}{100}\right) \therefore P_F \text{ is 1\% less than } P_I$$

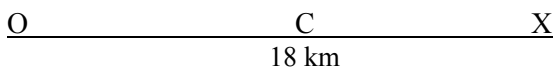
**23. (c)** Work done by both in one day =  $\frac{1}{10} + \frac{1}{8}$

Let Sriram works alone for x-more days.

$$\therefore 2 \left( \frac{1}{10} + \frac{1}{8} \right) + \frac{x}{8} = 1 \Rightarrow \frac{x}{8} = \frac{11}{20} \Rightarrow x = 4.4 \text{ days}$$

**24. (d)** Let the speed be changed at C. To find distance CX

$$\frac{18 - CX}{4} + \frac{CX}{3} = 5 \Rightarrow \frac{CX}{12} = \frac{2}{4} \Rightarrow CX = 6 \text{ km.}$$



**25. (b)** Let x be the distance (in km) and 't' be the time in hrs from present moment to 2 pm. then,  $\frac{x}{4} = t + \frac{5}{60}$  and

$$\frac{x}{5} = t - \frac{10}{60}$$

$$\Rightarrow \frac{x}{5} = \frac{x}{4} - \frac{5}{60} - \frac{10}{60} \Rightarrow \frac{x}{20} = \frac{1}{4} \Rightarrow x = 5 \text{ km}$$

**26. (c)** Let total marks be x.

$$\Rightarrow \frac{40}{100} x = 253 + 27 = 280 \Rightarrow x = \frac{2800}{4} = 700$$

**27. (d)**  $x = x + b$ . Given  $a = 3b + 2 \therefore x = 3b + 2 + b \Rightarrow x = 4b + 2$

$$\Rightarrow b = \frac{x-2}{4} \therefore a = \frac{3x-6}{4} + 2 = \frac{3x+8-6}{2}$$

$$\Rightarrow a = \frac{3x+2}{4}$$

**28. (b)** In 60 minutes the hour hand covers  $30^\circ$   $\therefore$  in 30 minutes the hour hand covers  $15^\circ$ . In 60 minutes the minute hand covers  $360^\circ$ . Thus in 30 min., the minute hand covers  $180^\circ$ . Therefore, the smallest angle between hour and minute needles when time is 12 Hr 30 mt is  $= 180 - 15 = 165^\circ$ .

**29. (a)** The letters of the word arrange themselves in alphabetical order for its coding.

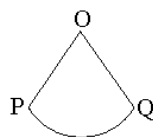
**30. (b)** The series is  $\times 1, \times 1.5, \times 2, \times 2.5, \dots$

**31. (c)** Angle turned by minute hand in 10 minutes.

$$= 10 \times 6^\circ = 60^\circ$$

$$\text{Area of sector POQ} = \frac{60^\circ}{360^\circ} \times \pi (10.5)^2$$

$$= \frac{1}{6} \times \frac{22}{7} \times 10.5 \times 10.5 = 57.75 \text{ cm}^2$$



$$\mathbf{32. (b)} \quad R = \frac{10}{3} \times 50 - 50 = \frac{350}{3} \text{ years}$$

**33. (c)** Ratio of B and C is unknown.

$$\mathbf{34. (d)} \quad x - y = \frac{1}{3}, x + y = 30$$

$\therefore x$  and  $y$  easily be found out.

$$\mathbf{35. (a)} \quad \text{Req. length from I} = 60 \times \frac{5}{18} \times 12 = 200 \text{ mts}$$

(because  $1 \text{ km/hr} = 5/18 \text{ m/s}$ )

**36. (d)** **37. (d)**

**38. (b)**  $2/5$  of  $80 = 32$ . So Rohit, Pratik are allowed to appear

**39. (a)** % of classes attended by

$$\text{Pratik} = \frac{323}{480} \times 100 = 67.29\%$$

$$\text{Silpi} = \frac{262}{480} \times 100 = 54.58\% \therefore \text{Average} = 60.93$$

$$\mathbf{40. (b)} \quad \text{Kunal attended } \frac{296}{480} \times 100 = 61.66\%$$

$$\text{Ravi attended } \frac{327}{480} \times 100 = 68.12\%$$