

**BOOST UP PDFS | Reasoning Ability | Miscellaneous Questions
(Moderate Level Part-1)**

Recommend for SBI PO, SBI Clerk, IBPS RRB/PO/Clerk Exams

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Direction (1-3): Read the following information carefully and answer the questions given below.

Eight persons A, B, C, D, E, F, G, H are in different heights. A is taller than only two persons. F is taller than A, but not taller than D. There are four members between H and G, and both are not tallest or shortest among the group. B is tallest among all the persons. Only two persons between B and E. G is shorter than E.

1. Who among the following persons was second tallest?

- a. G
- b. H
- c. D
- d. F
- e. None of these

2. How many persons are between D and G?

- a. None
- b. Two
- c. One
- d. Three
- e. Cannot be determine

3. If A is 164 cm and D is 171 cm, then what will be the possible height of F?

- a. 160 cm

- b. 172 cm
- c. 162 cm
- d. 168 cm
- e. 174 cm

Directions (4-5): Read the following information carefully and answer the questions given below.

There are 7 people – A, B, C, D, E, F, and G having different heights. B is taller than A but shorter than F. F is not the tallest. D is just below A height wise. C is shorter than B. G is shorter than C. F has height equal to 146 cm. The one who is second shortest has height 130 cm. D is not the shortest.

4. Who is the shortest of all?

- a. C
- b. G
- c. E
- d. Cannot be determined
- e. None of these

5. If height of A is 131 cm, what could be the possible height of C?

- a. 135 cm
- b. 126 cm
- c. 129 cm
- d. 119 cm

e. 120 cm

Directions (6-8): Study the following information carefully and answer the questions given below:

There are six persons who all are of different height. A is taller than C and D but shorter than E. The one who is third shortest is 102cm in height. B is taller than A. E is not the tallest. The one who is second tallest is 119cm in height. Neither A nor C is the third shortest person among all. C is not the shortest among all. F is taller than D.

6. Who among the following is the second tallest?

- a. F
- b. E
- c. A
- d. C
- e. None of these

7. What will be the possible height of A?

- a. 120cm
- b. 100cm
- c. 112cm
- d. 101cm
- e. None of these

8. Who among the following is third shortest?

- a. A
- b. C
- c. B
- d. F
- e. None of these

Directions (9-10): Study the following information carefully and answer the questions.

Six plates have different sizes. Size of plate F and B are greater than plate A. Plate C is greater than A but smaller than F and B. D is not smallest but smaller than C. Size of plate F is smaller than plate E but greater than plate B. It is given 3rd largest plate is 132 cm. Smallest plate is 69 cm.

9. What may be the value of plate C (possibly)?

- a. 117 cm
- b. 135 cm
- c. 169 cm
- d. 158 cm
- e. None of these

10. Which one is the greatest plate (according to size)?

- a. F
- b. B
- c. D
- d. E
- e. None of these

Directions (11-13): Study the following information carefully and answer the question given below.

(i) A, B, C, D, E, F, G, and H are eight students each having a different height.

(ii) D is shorter than A but taller than G.

(iii) E is taller than H but shorter than C.

(iv) B is shorter than D but taller than F.

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(v) C is shorter than G.

(v) G is not as tall as F.

11. Which of the following is definitely true?

a. G is shorter than F

b. C is shorter than F

c. F is taller than C

d. B is taller than E

e. All are true

12. If another student J who is taller than E shorter than G is added to the group, which of the following will be definitely true?

a. C and J are of same height

b. J is shorter than D

c. J is shorter than H

d. J is taller than A

e. None of the above

13. Which of the following will definitely be the third from the top when the eight students are arranged in descending order of height?

a. B

b. F

c. G

d. B or G

e. Cannot be determined

Directions (14-15): Study the following information carefully and answer the questions given below:

Six friends have different weights. E is heavier than G and K but not as much as F. L is only lighter than M. The

one who is second heaviest is 56kg. The weight of third lightest is 47 kg. K is 10kg lighter than E. G is of 18kg.

14. What can be the weight of F?

a. 58 kg

b. 70 kg

c. 50 kg

d. 45 kg

e. None of these

15. If M is 13kg heavier than E then what will be the sum of the weights of M and the second lightest person?

a. 88 kg

b. 90 kg

c. 97 kg

d. 105 kg

e. None of these

Directions (16-18): study the given information carefully to answer the given questions.

Ramya & Rajesh are a married couple having two daughters named Reetika & Devika. Devika is married to Arav who is the son of Siya and Jeevan. Saumya is the daughter of Arav. Ganga who is Arav's sister is married to Sunil and has two sons Ayush&Ankit. Ankit is the grandson of Siya and Jeevan.

16. How is Ganga related to Devika?

a. Sister – in – Law

b. Sister

c. Aunt

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d. None of these

e. None of these

17. What is the relationship between Ayush & Saumya?

a. Uncle – Niece

b. Father – Daughter

c. Husband – Wife

d. Cousins

e. None of these

18. Which of the following is true, if Siya is female?

a. Ayush is the son of Reetika

b. Saumya is the cousin of Ganga

c. Siya is Sunil's mother – in – Law

d. Jeevan is Devika's Maternal Uncle

e. None of these

Directions (19-21): study the given information carefully to answer the given questions.

Rita, Ramesh & Rajender are children of Mr. and Mrs. Sharma. Renuka, Rajeev & Santosh are children of Mr & Mrs. Srivastava. Santosh & Rita are a married couple and Kumar & Sanjeev are their children. Geetika & Lokesh are children of Mr & Mrs. Kohli. Geetika is married to Rajender and has three children named Reema, Abhay & Ravi.

19. How is Ramesh related to Kumar (possibly)?

a. Father – in – Law

b. Brother – in – Law

c. Cousin

d. Maternal Uncle

e. None of these

20. What is Sanjeev's surname?

a. Kohli

b. Srivastava

c. Sharma

d. Rajender

e. None of these

21. If Renuka is sister in law of Rita, then Renuka is Sanjeev's....

a. Sister – in – Law

b. Sister

c. Cousin

d. Aunt

e. None of these

Directions (22-26): study the given information carefully to answer the given questions.

In a group there are 6 persons U, V, W, X, Y & Z. W is the sister of Z. V is the brother of Y's husband. X is the father of U and grandfather of Z. There are two fathers, three brothers and a mother in the group. U and V are siblings.

22. Who is the mother?

a. U

b. V

c. X

d. Y

e. None of these

23. Who is Y's husband?

- a. V
- b. W
- c. U
- d. Y
- e. None of these

24. How many male members are there in the group?

- a. 3
- b. 1
- c. 2
- d. 4
- e. None of these

25. How is Z related to Y?

- a. Son
- b. Uncle
- c. Husband
- d. Daughter
- e. None of these

26. Which of the following is a group of brothers?

- a. UVZ
- b. UVX
- c. VZW
- d. VXZ
- e. None of these

Directions (27-28): study the given information carefully to answer the given questions.

T is son of P. V is sister of T and is granddaughter of Q, who is mother of S. who is brother of P. Only two males are there in a family.

27. How P is related to V?

- a. Uncle
- b. Aunt
- c. Son
- d. Daughter
- e. Mother

28. How is T related to Q?

- a. Daughter
- b. Son
- c. Grandson
- d. Niece
- e. None of these

Directions (29-30): study the given information carefully to answer the given questions.

G is a maternal grandfather of P. C married to G. R and K are children of C. S is the mother of P. K is the brother-in-law of M. U is the mother of D. K has only one son. R is the sister-in-law of M. K and U are married couple.

29. How R is related to P?

- a. Aunt
- b. Uncle
- c. Sister
- d. Mother
- e. None of these

30. How is P related to M?

- a. Daughter
- b. Son
- c. Niece
- d. Data Inadequate
- e. None of these

Directions (31-33): study the given information carefully to answer the given questions.

S is the husband of D. A is the brother of D. A is the only son of B. D is the sister of Q. R is married to Q. M is the father of R. N is the daughter of Q. Q is a male.

31. If V is the maternal Grandfather of N, then how is B related to R?

- a. Uncle
- b. Mother-in-law
- c. Grandmother
- d. Aunt
- e. Father-in-law

32. How is S related to Q?

- a. Father
- b. Grandmother
- c. Brother –in- law
- d. Uncle
- e. Nephew

33. How is D related to N?

- a. Mother
- b. Sister-in-law
- c. Cousin

- d. Mother-in-law
- e. Aunt

Directions (34-35): study the given information carefully to answer the given questions.

K is the brother of J. J is the mother of Y. Y is the sister of T. T is married to Q. S is the father of J. S has only one daughter. S is married to R. K is the brother of D. U is the father-in-law of D. C is the only child of U.

34. How is D related to Y, if D is brother of J?

- a. Cannot be determined
- b. Mother
- c. Uncle
- d. Father
- e. Aunt

35. If C is daughter of U, then how is D related to C?

- a. Cousin
- b. Husband
- c. Wife
- d. Cannot be determined
- e. Brother

Directions (36-38): study the given information carefully to answer the given questions.

Nine members R, H, J, T, Q, P, F, M and S are in a family. T is father in law of Q, who is sister in law of J. Q has no siblings. P is daughter of J. H is the only brother in law of F. J and H are married couples. F is

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unmarried. F is daughter of R. S is the only son of M.
There are three married couples in a family.

36. How F is related to M?

- a) Brother in law
- b) Sister
- c) Sister in law
- d) Cousin
- e) None of these

37. How R is related to S?

- a) Grandfather
- b) Grandmother
- c) Grandson
- d) Granddaughter
- e) None of these

38. How Q is related to P?

- a) Aunt
- b) Uncle
- c) Mother
- d) Niece
- e) None of these

Directions (39-40): study the given information carefully to answer the given questions.

There are nine members in the family. M is unmarried sibling of F. B is sister-in-law of D. C is mother-in-law of E, who is parent of F. E has a daughter and a son. H is the only child of F. B has a sister and a brother. A is brother of C. G is the maternal grandmother of H. A is

the unmarried. D is husband of C. D has no siblings. M is brother of F. F is female.

39. Four of the five are alike in a certain way, who among the following does not belongs to that group?

- a. A
- b. B
- c. C
- d. D
- e. F

40. How is D related to M?

- a. uncle
- b. aunt
- c. Maternal grandfather
- d. Maternal grandmother
- e. None of these

41. In a row of boys facing North, Rinku is 10th to the left to Pink who is 21st from the right end. If Miku who is 17th from the left end, is 4th to the right of Rinku, then how many boys are there in the row?

- a. Data inadequate
- b. 44
- c. 37
- d. 43
- e. None

42. In a class of 20 students, Mridul's rank is 12th from the top and Veena's rank is 17th from the bottom. If Rohan's rank is exactly between Mridul

and Veena's rank, what is Rohan's rank from the top?

- a. Ninth
- b. Eighth
- c. Tenth
- d. Seventh
- e. Cannot be determined

43. Seven persons A, D, B, R, S, Z and K are in a family. There are three married couples in a family. Z is the only son of B's daughter. D is sister in law of A, who is sister of S. D has no siblings. K is son in law of R. R has two children. R is grandmother of Z. D is daughter in law of B. How S is related to K?

- a) Sister in law
- b) Daughter in law
- c) Brother
- d) Brother in law
- e) None of these

44. In a class of 75 students, where boys are twice that of girls. Dhanuja ranked thirteenth from top. If there are four girls ahead of Dhanuja, how many boys are after her in rank?

- a. 43
- b. 42
- c. 44
- d. None of these
- e. 41

45. In a row of 45 girls facing south, P is 18th from the right end. There are ten girls in between P and S. what is the position of S from left end of the row?

- a. 38
- b. 16
- c. 32
- d. Data inadequate
- e. None of these

46. Seven persons A, D, B, R, S, Z and K are in a family. There are three married couples in a family. Z is the only son of B's daughter. D is sister in law of A, who is sister of S. D has no siblings. K is son in law of R. R has two children. R is grandmother of Z. D is daughter in law of B. How R is related to A?

- a) Mother in law
- b) Father in law
- c) Mother
- d) Father
- e) None of these

47. In a row of children facing North, Rajan is twelfth from the right end and is fifth to the right of Satyarthi who is tenth from the left end. Total how many children are there in the row?

- a. 29
- b. 28
- c. 26
- d. 27
- e. None of these

48. In a row of children facing North, Ram is thirteenth from the right end and is third to the right of Shyam who is ninth from the left end. Total how many children are there in the row?

- a. 29
- b. 28
- c. 24
- d. 27
- e. None of these

49. Ram is 11th to the left of Shyam, who is 15th from the left end and Harsh is 20th from the right end of a row, then what is the position of Ram from the right end of the row?

- a. 51

- b. 50
- c. 49
- d. Cannot be determined
- e. None of these

50. Ajay ranked sixteenth from the top and twenty-ninth from the bottom among those boys who passed an examination. Six boys did not participate in the competition and five failed in it. How many boys were there in the class?

- a. 40
- b. 44
- c. 50
- d. 55
- e. 58

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Answer Key with Explanation

Solution(1-3)

B>H>D>E>F>A>G>C

1. B 2. D

B>H>D(171)>E>F>A(164)>G>C

3. D

Solution (4-5)

4. B

E > F > B > A > D > C > G OR

E > F > B > C > A > D > G

Both gives G the shortest.

5. A

A = 131 cm, so D = 130 cm so becomes second shortest. So

E > F > B > C > A > D > G becomes true. So C's height > 131 cm

Solution(6-8)

$B > E > A > F > C > D$

6. B 7. C 8. D

Solution(9-10)

$E > F > B(132) > C > D > A(69)$

9. A 10. D

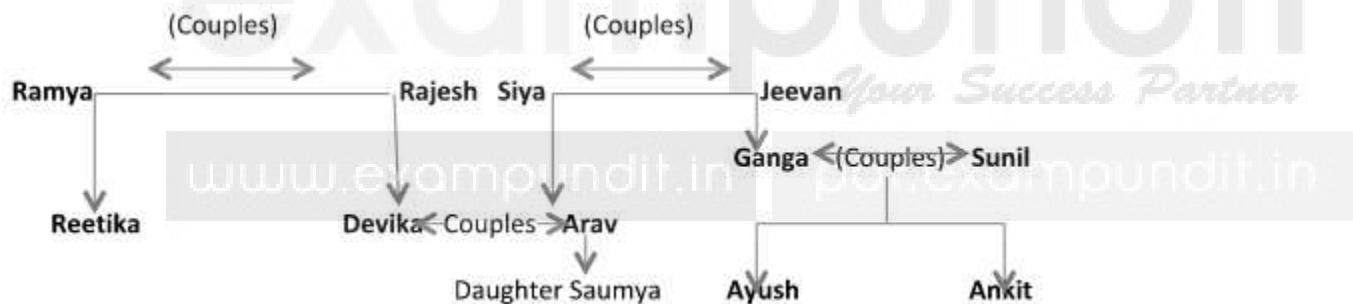
$A > D > B > F > G > C > E > H$

11. E 12. B 13. A

$M > L(56) > F > E(47) > K(37) > G(18)$

14. C 15. C

Solution (16-18)

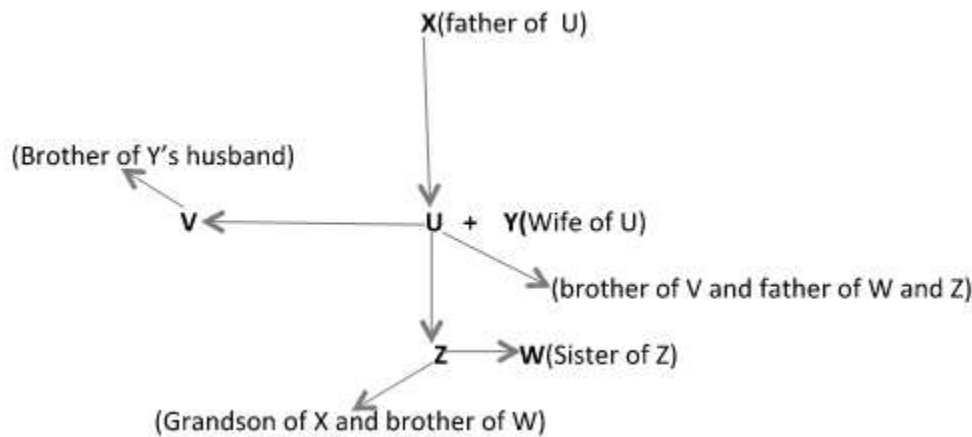


16. A 17. D 18. C

Solution (19-21)

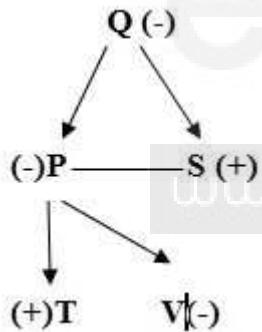
19. D 20. B 21. D

Solution (22-26)



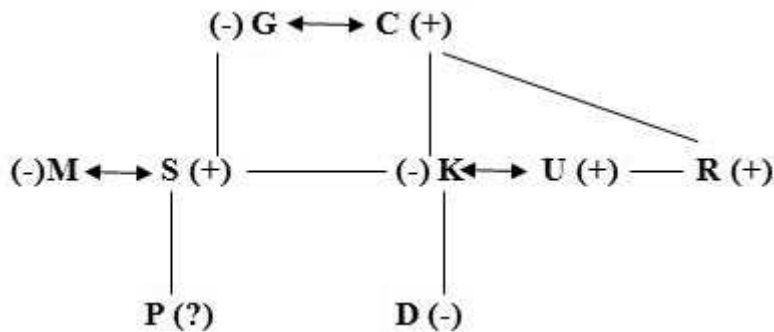
22. D 23. C 24. D 25. C 26. A

Solution (27-28)



27. E 28. C

Solution (29-30)

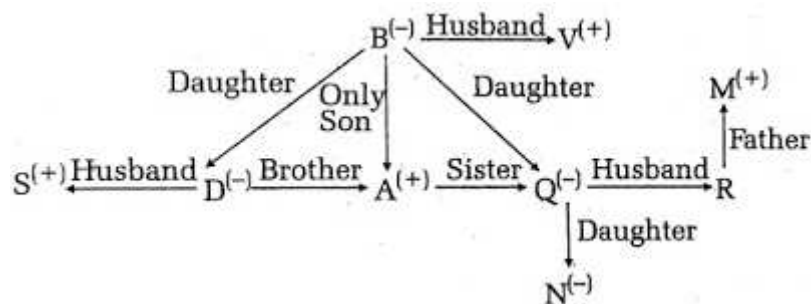


(-) => Males

(+) => Females

29. A 30. D

Solution (31-33)

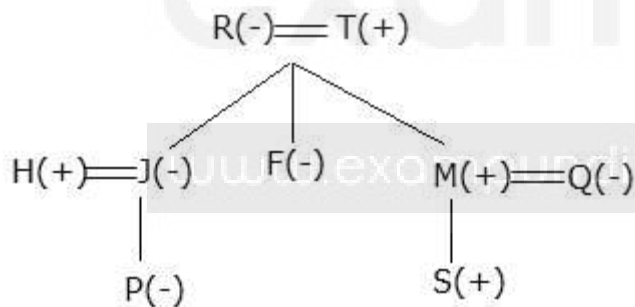


31. B 32. C 33. E

Solution (34-35)

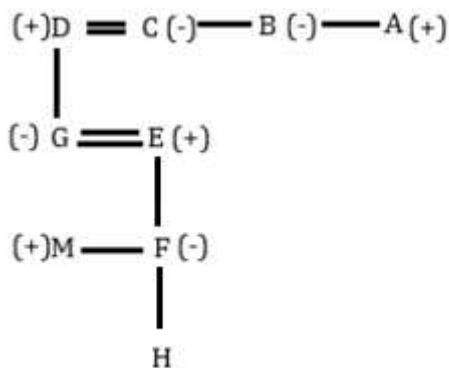
34. C 35. B

Solution (36-38)



36. C 37. B 38. A

Solution (39-40)



39. E 40. C

Solution:

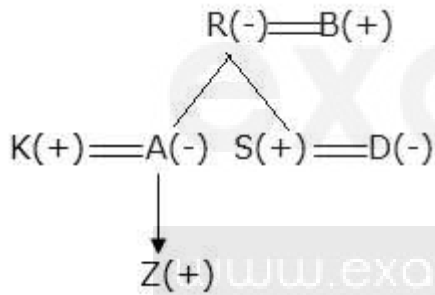
41. D

Given, →Pink is 21st from the right end and Rinku is 10th to the left of Pink →So, Rinku is 31st (i.e., $21 + 10$) from the right end. →Miku is 17th from the left end and 4th to the right of Rinku. →So, Rinku's position from the left end with respect to Miku = 14th →Total number of boys = Position of Rinku from R.H.S + Position of Rinku from L.H.S - 1 = $31 + 14 - 1 = 43$

42. B

Veena's rank is 17th from the bottom means Veena's rank is 4th from the top. Rohan's rank is exactly between 4th and 12th, ie 8th.

43. D



44. B

The number of girls and boys in the class is 25 and 50 respectively.

According to the question, there are 4 girls ahead of Dhanuja.

∴ $12 - 4 = 8$ boys are ahead of her.

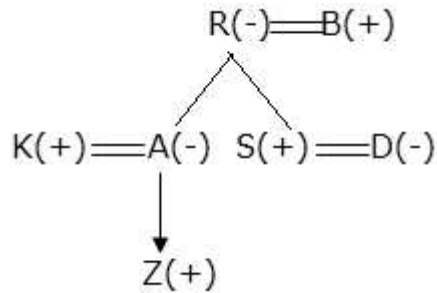
Hence, the number of boys ranked after Dhanuja = $50 - 8 = 42$

45. D

There are two possibilities, either S is to the right of P or S is to the left of P.

Hence, data is inadequate to answer the question.

46. C



47. C

Sathyarathi's position from left end = 10th

Sathyarathi's position from right end = 17th

Total number of children in the row = $10 + 17 - 1 = 26$

48. C 49. D

Since it is not given that how many persons are sitting in the row then we can't determine the position of ram from the other end.

50. D

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Directions (1-4): Study the following information and answer the questions given below:

There are nine members in a family. Each has different amount of chocolates. A has 250 chocolates, he takes 12 chocolates and gives the remaining to his only son L. L takes 7 chocolates and gives the rest of the chocolates to his mother F. F takes 9 chocolates and gives the remaining chocolates to his only Nephew S. S takes 5 chocolates and gives the remaining chocolates to his father D. D takes 8 chocolates and gives the remaining chocolates to G, who is his only niece. G takes 14 chocolates and gives the rest of the chocolates to her only sister-in-law H. J's mother H, takes 7 chocolates and gives the remaining chocolates to her only son K. K takes 19 chocolates and gives the rest to his only sister J. Only F and D are siblings.

1) How is D related to L and what is the total number of chocolates both have?

- a) Grandfather – 15 Chocolates
- b) Niece – 17 Chocolates
- c) Nephew – 14 Chocolates
- d) Aunt – 12 Chocolates
- e) Uncle – 15 Chocolates

2) What is the square root of the number of Chocolates J is having and how is J related to F?

- a) 13 – Grandson
- b) 13 – Granddaughter
- c) $\sqrt{173}$ – Daughter
- d) $\sqrt{184}$ – Grandfather
- e) Cannot be determined

3) If $A \times B = A$ is sister of B, $A + B = A$ is the son of B, $A - B = A$ is the daughter of B, $A \% B = A$ is the father of B. Then which of the following statement is true regarding the given relation?

- (i) $H \times L + A \times S$; H gets 190 Chocolates from G
- (ii) $L + F \times D \% S$; S gets 222 Chocolates from F

(iii) $G - A \% L \times H$; G gets 217 Chocolates from D

(iv) $J \times K + L + A$; K gets 188 Chocolates from H

- a) Only (ii) is true
- b) Both (i) and (iii) are true
- c) Both (ii) and (iv) are true
- d) Only (iv) is true
- e) None of these

4) How is S related to H?

- a) Brother
- b) Sister
- c) Sister in law
- d) Cousin
- e) None of these

Direction (5-8) Study the following information and answer the questions given below:

A @ B means A is the father of B

A % B means A is the mother of B

A \$ B means A is the brother of B

A ! B means A is the sister of B

A * B means A is the daughter of B

A & B means A is the son of B

A # B means A is the husband of B

A ~ B means A is the wife of B

5. Which of the following statement is true?

Q @ P % M * L & K

- a) K is father of L
- b) Q is mother of P
- c) M is grandson of K

- d) Q is father in law of L
- e) None of these

6. Which of the following statement is false?

$L \sim M \$ P * R \# S ! J$

- a) R is the father of M
- b) L is the sister in law of P
- c) P is niece of J
- d) J is aunt of M
- e) None of these

7. Which of the following means M is uncle of P?

- a) $P ! B \# L \$ M ! N$
- b) $P ! B * L \$ M \# N$
- c) $P ! B \$ L \& M \# N$
- d) $P ! B \& L \$ M \# N$
- e) Either b or d

8. Which of the following combination comes in the places of hyphen so that D is niece of Q should be true?

W_D_U_Q_Z

- a) @, %, %, #
- b) @, *, *, \$
- c) #, *, \$, @
- d) @, *, *, #
- e) None of these

Direction (9-12) Study the following information and answer the questions given below:

$A \% B$ means A is the husband of B

$A \sim B$ means A is the wife B

$A * B$ means A is the father of B

A\$B means A is the mother of B

A#B means A is the brother of B

A+B means A is the sister of B

A!B means A is the daughter of B

A&B means A is the son of B

9. In which of the following statement 'Q is sister in law of S' is definitely true?

a) T+S*R%P+Q

b) Q*R+S%P\$T

c) P*Q+R%S\$T

d) P+Q%R+S%T

e) None of these

10. Which of the following statement is definitely true according to the expression A*J%T\$M#U~K?

a) U is granddaughter of A

b) M is Daughter of J

c) T is son in law of A

d) J is father of K

e) None is true

11. In which of the following expressions does K is cousin of J is definitely true?

a) Q!J#O+K%M+P

b) K!M%Q+P%O\$ J

c) M+J#O%P!Q* K

d) M*J+P% K!O!Q

e) None of these

12. Which of the following combination comes in the underscore to make 'Z is brother in law of M's mother's father in law' is definitely true?

Z_N_J_X_T_M

a) %, +, #, *, !

- b) %, +, *, %, #
- c) %, +, *, %, \$
- d) +, %, !, \$, #
- e) None of these

Direction (13-16) Study the following information and answer the questions given below:

A!B' means 'A and B are married couples'

'A@B' means 'A is the mother in law of B'

'A%B' means 'B is the father in law of A'

'A#B' means 'B is the sister in law of A'

'A*B' means 'B is the brother in law of A'

'A&B' means 'B is the only son of A'

'A~B' means 'A and B are siblings'

'A\$B' means 'B is the father of A'

'A+B' means 'B is the daughter of A'

'A^B' means 'A and B are cousins'

I. T!D+H

II. D\$K~S

III. L&K*P!S

IV. O!N&I

V. K!M%C!L

VI. O*T~N

VII. Q^D#N

13. How is T related to S based on the above expression?

- a) Brother's daughter in law
- b) Wife of her nephew
- c) Husband of her niece
- d) Sister's son in law

e) None of these

14. If 'P&Q!Z' then how is Z related to L?

a) Granddaughter

b) Grandson

c) Husband of L's granddaughter

d) Wife of L's grandson

e) None of these

15. How many male members are there in the family if Q is a female?

a) Four

b) Five

c) Six

d) Seven

e) None of these

16. Which of the following is definitely true according to the above expression?

a) M is son in law of L

b) T is sister in law of O

c) I is niece of T

d) H is grandson of M

e) None is true

Direction (17-20) Study the following information and answer the questions given below:

'A@B' means 'A and B are siblings'

'A#B' means 'A and B are married couple'

'A*B' means 'B is the only daughter of A'

'A\$B' means 'A and B are cousins'

'A!B' means 'A is the sister-in-law of B'

'A%B' means 'A is the brother-in-law of B'

'A~B' means 'B is either nephew or niece of A'

17. Which of the following indicates that 'Q is the granddaughter of R'?

- a) P # R * U @ T % M ! Q \$ S
- b) P @ R * U # T % M \$ Q # S
- c) P \$ R * U % T @ M * Q # S
- d) P # R * U @ T % M * Q \$ S
- e) None of these

18. Which of the following can be the correct relationship drawn from the given expression

'N # L % J @ N ! K * C @ M \$ D'?

- a) L is the sister-in-law of J
- b) K is the uncle of D
- c) N is the aunt of M
- d) D is the nephew of J
- e) None of these

19. According to this expression 'A * L # M * K @ N % J ~ Z' How is Z related to M?

- a) Daughter
- b) Son
- c) Grand daughter
- d) Grand son
- e) Either c) or d)

20. According to this expression 'M % J @ L ! K * B # D % X ~ W' which of the following is false, Consider M and K do not have siblings. X is brother of B?

- a) L is the aunt of X
- b) M is married to J's sister
- c) W is the nephew of X
- d) D is the son-in-law of J
- e) None of these

Direction (21-24) Study the following information and answer the questions given below:

A+B' means 'B is the child of A'

'A#B' means 'A and B are siblings'

'A@B' means 'A and B are married couples'

'A*B' means 'B is the only son of A'

'A\$B' means 'A and B are cousins'

'A!B' means 'A is the mother in law of B'

'A%B' means 'B is the father in law of A'

'A^B' means 'B is the sister in law of A'

'A~B' means 'B is niece of A'

'A-B' means 'A is the daughter in law of B'

I. M @ K - N

II. L + M \$ J @ B

III. L @ N # T

IV. A @ Y * T

V. T @ S ! B

VI. T ^ Z ~ J + X

VII. Z # S % A

VIII. L is wife of T and Z is female.

21. Which of the following is definitely true according to the above expression?

- a) L is the sister in law of T
- b) B is the father in law of S
- c) B is the son in law of Z
- d) N is the paternal aunt of J
- e) None of these

22. According to the above expression, how is A related to B?

- a) Grand father

- b) Mother in law's father
- c) Wife's grandmother
- d) Mother in law's father in law
- e) None of these

23. If 'X is daughter of B' then how is X related to T?

- a) Grand son
- b) Grand daughter
- c) Either a or b
- d) Nephew
- e) Cannot be determined

24. How M related to Z?

- a) Sister in law's niece
- b) Brother's nephew
- c) Brother in law's nephew
- d) Cannot be determined
- e) None of these

Directions (25-28) Study the following information and answer the questions given below:

X%%Y means, X is the uncle of Y.

X@@Y means, X is the Aunt of Y.

X&Y means, X is the Brother-in-law of Y.

X\$Y means, X is the Sister-in-law of Y.

X!Y!!A,B means X and Y has two children A and B.

X#Y means, X is the Son of Y.

X**Y means, X is the only nephew of Y.

X*Y means, X and Y are the married couple.

25. If X*S@@T#C, S has no brother or sister. Then how is C related to S ?

- a. Brother-in-law
- b. Sister-in-law
- c. Nephew
- d. Niece
- e. Can't be determined.

26. If D%%F#W;F&V;V is female and married to G. How is G related to W?

- a. Son
- b. Daughter
- c. Father
- d. Mother
- e. None of these

27. If P#L*NSH. If Q is brother of P. How is H related to Q ?

- a. Aunt
- b. Uncle
- c. Nephew
- d. son
- e. Can't be determined

28. If N@@T*S#V. How is T related to V ?

- a. Daughter in law
- b. Son-in-law
- c. Son
- d. Daughter
- e. Aunt

Direction (29-30) Study the following information and answer the questions given below:

‘A-B’ means ‘B is the son of A’

‘A#B’ means ‘A and B are siblings’

‘A@B’ means ‘A and B are married couples’

‘A*B’ means ‘B is the only daughter of A’

‘A\$B’ means ‘A and B are cousins’

‘A!B’ means ‘A is the mother in law of B’

‘A%B’ means ‘B is the father in law of A’

‘A^B’ means ‘B is the sister in law of A’

I. J@L^M

II. L#C@M-O

III. K@S%J-K- D

IV. W#S^X

V. W@X*N

VI. U@T#D^U

29. How J related to W according to the above expression?

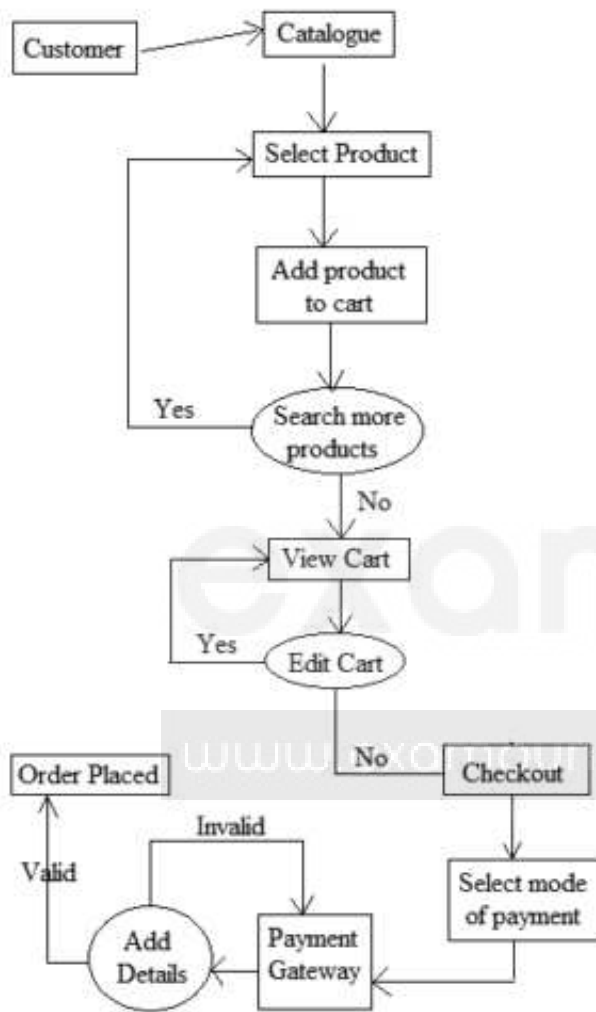
- a. Grand father
- b. Father in law
- c. Brother in law's mother
- d. Sister's father in law
- e. None of these

30. Which of the following is false based on the above expressions?

- a. K and S are married couples
- b. J and L are grandparents of D
- c. W is maternal uncle of T
- d. O is unmarried
- e. None is false

Directions (31-35): See the following structure carefully and answer the given questions

A person has decided to buy a product from an online shopping website. So, different steps are given in the form of a data flow diagram. Study the given data flow diagram and answer the questions that follow.



31. Which of the following condition will decrease the data flow diagram to minimum number of steps?

- a. The person's account is restricted to one item per order.
- b. The person wants to have cash on delivery.
- c. Shipping details of person is already saved in the account.
- d. The person fills in the payment details correctly.
- e. All of these

32. Which of the following step is logically missing in the given data flow diagram?

- a. The cost of the product selected.

- b. If more than one payment gateway is available then which to select.
- c. The product is available or not.
- d. The sections from which selection to be made.
- e. These all are not important

33. After which step, shipping details should be asked?

- a. After finalizing the cart items.
- b. After the checkout step.
- c. Before view cart.
- d. After selecting the mode of payment.
- e. Cannot be determined

34. Which step will ensure that the product will be successfully ordered?

- a. Product delivery is available at specific location.
- b. Valid payment details are known.
- c. Payment gateway is secured.
- d. There is no other product in the cart before selecting the required product.
- e. None of these.

35. Which of the following step is logically missing in the given data flow diagram?

- a. Quantity of products to be added to cart.
- b. If more than one payment gateway is available then which to select.
- c. The catalogue is updated or not.
- d. The options available for payment.
- e. These all are not important.

Directions (36-40) Read the following information carefully and answer the questions given below

In a certain code, the symbol for 0 is @ and for 1 is \$. There are no other symbols for all other numbers greater than one. The numbers greater than 1 are to be written only by using the two symbols given above. The value of the symbol for 1 doubles itself every time it shifts one place to the left. Study the following examples:

0 is written as @

1 is written as \$

2 is written as \$ @

3 is written as \$\$

4 is written as \$@@ and so on.

36. Which of the following codes will represent the sum of \$\$@@@ + \$@@@ + \$@@@?

a. \$\$\$@

b. \$\$\$@

c. \$\$\$@

d. \$\$\$@

e. None of these

37. Which of the following will be the code for 98?

a. \$\$\$@

b. \$\$\$@

c. \$\$\$@

d. \$\$\$@

e. None of these

38. Which of the following numbers will be represented by @\$@?

a. 175

b. 196

c. 100

d. 162

e. None of these

39. Which of the following will represent the value of $95 + 26 / 2 - 35 / 7$?

a. \$\$\$@

b. \$\$\$@

c. @@

d.\$@\$@\$

e. None of these

40. Which of the following codes, when decoded, will give odd number as the result?

a. \$@@\$@\$

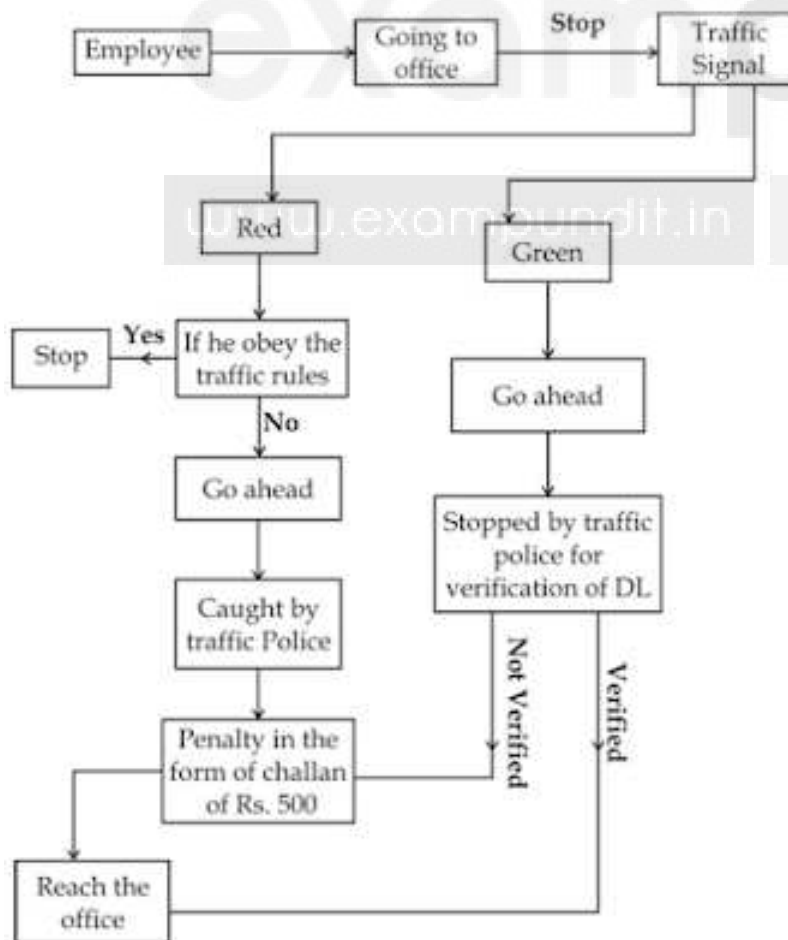
b. \$\$@\$\$\$@

c. @\$\$\$\$@

d. \$@@@@\$

e. None of these

Direction (41-45): See the following structure carefully and answer the given questions.



Employee 'A' is going to his office so, different conditions are given in Data flow diagram. So after analyzing above DFD diagram you have to answer the given questions:

41. If employee A is a very sincere person and an honest Indian but he does not stop at the red signal. What can be the possible valid reason for that?

- a. The brake of his bike is failed due to which he does not stop at red light.
- b. The friend of that employee got an accident and he has to go to help him.
- c. Data insufficient
- d. He did not see the red light at the traffic signal.
- e. All of these

42. Which among the following is the case when the employee will reach his office at the right time which is fixed at 10 am?

- a. He will go to office after breaking the red light at traffic signal but he will pay Rs. 500 fine to traffic police when he get caught and after that he will reach the office.
- b. He will stop at red signal but he will go further through the shortcut route to reach the office at right time.
- c. All of these
- d. He will go to the office when he get green light at traffic signal and he will provide DL to the traffic police when he will be stopped by traffic police and then he will reach the office.
- e. Data insufficient.

43. Which of the following step is missing in the above data flow diagram just before the step of reaching the employee to his office?

- a. When he will pay fine of 500 to traffic police then he get warning from the traffic police to not breaking the rule again anyways he will get imprison in future.
- b. He will pass another traffic signal which is missing in the data flow diagram.
- c. When he will be stopped by the traffic police for the verification of DL, the traffic police will also verify other documents such as bike papers in the favour of owners name and insurance paper of bike.
- d. Both a and c
- e. He will argue with the traffic police for not paying the 500 rupees.

44. If he gets caught by the traffic police for breaking the red light at traffic signal, what will he do if he has no money?

- a. He will go to police station with the police.
- b. He will provide his address and phone number to police and will make a promise to pay it next day.
- c. He will do bargaining with the traffic police to pay less rupees.
- d. He will request to traffic police to leave him.
- e. Data insufficient

45. What will be the case that he will reach office late after coming to office through green light at the traffic signal?

- a. The speed of his bike is reduced due to some mechanical problem.
- b. He will not provide DL to the traffic police so he has to pay fine of 500 rupees.
- c. He has to stop at another traffic signal after the verification of DL.
- d. None of these
- e. Both a and b

Directions (46-50) Read the following information carefully and answer the questions given below

In a certain code, the symbol for 0 is @ and for 1 is \$. There are no other symbols for all other numbers greater than one. The numbers greater than 1 are to be written only by using the two symbols given above. The value of the symbol for 1 doubles itself every time it shifts one place to the left. Study the following examples:

0 is written as @

1 is written as \$

2 is written as \$ @

3 is written as \$\$

4 is written as \$@@ and so on.

46. Which of the following codes, when decoded, will give even number as the result?

- a. \$@\$@\$\$\$
- b. \$\$@@@@\$
- c. \$\$@@@@\$@

d.\$@\$\$\$

e.\$@\$\$\$\$.

47. Which of the following will be the code for 139?

a. \$\$\$@@\$

b. \$\$@\$@@\$

c. @\$@\$\$\$\$\$

d. \$@@@\$\$@

e. \$@@@\$@\$

48. Which of the following codes will represent the sum of \$\$\$@@\$+\$@@\$@+\$@@@@@ ?

a. \$\$@\$\$@@\$

b. \$\$@@\$@@

c. \$\$\$@@\$@\$

d. \$\$\$@@\$@

e. None of these

49. Which of the following numbers will be represented by \$\$\$\$\$\$?

a.175

b.127

c.125

d.162

e. None of these

50. Which of the following will represent the value of 45% of 180 + ?% of 160 = 50% of 274 ?

a.\$\$\$@@\$

b.\$\$@@\$

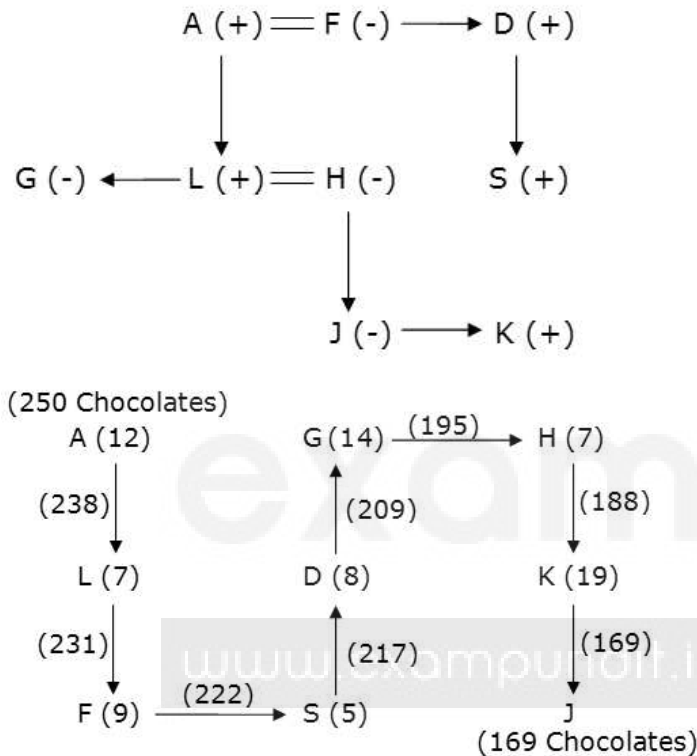
c.@@\$\$\$\$

d. \$@@@\$

e.None of these

Answer Key with Explanation

Solution (1-4)



1) Answer: E

D is the Uncle of L.

D → 8 Chocolates

L → 7 Chocolates

Total = 8 + 7 → 15 Chocolates.

2) Answer: B

J has 169 Chocolates.

$\sqrt{169} \rightarrow 14$.

J is the Granddaughter of F.

3) Answer: C

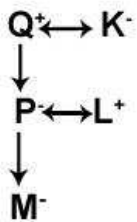
From the above blood relation diagram, we get only statement (ii) and (iv) to be true.

4)

Solution (5-8)

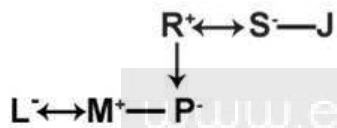
5. D

Q @ P % M * L & K



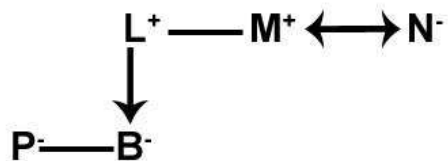
6. D

L ~ M \$ P * R # S ! J



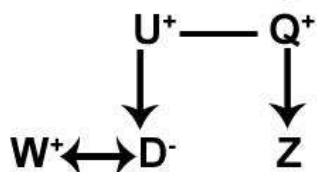
7. E

P ! B * L \$ M # N



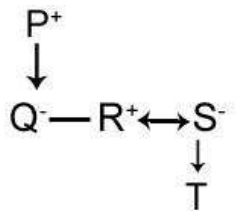
8. C

W # D * U \$ Q @ Z

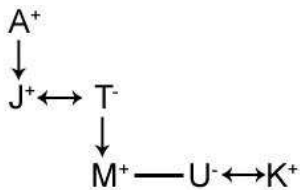


Solution (9-12)

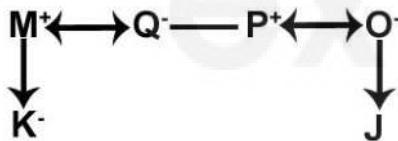
9. C



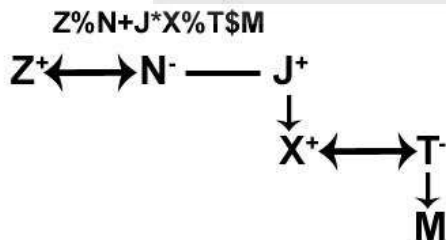
10. A



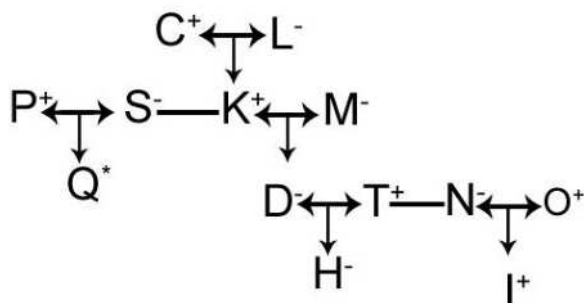
11. B



12. C



Solution (13-16)



13. C

14. D

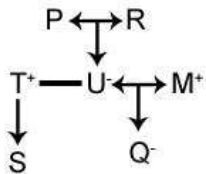
15. C

16. E

Solution (17-20)

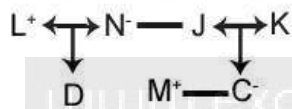
17. D

P#R*U@T%M*Q\$S



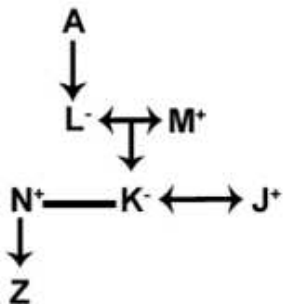
18. C

N#L%J@N!K*C@M\$D



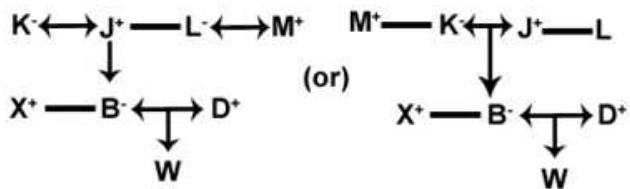
19. E

A*L#M*K@N%J~Z

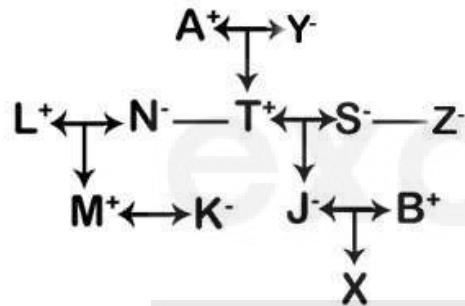


20. D

M % J @ L ! K * B # D % X ~ W



Solution (21-24)

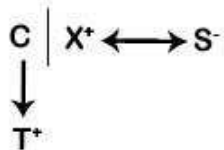


21. D 22. D 23. B 24. C

Solution (25-28)

25. E

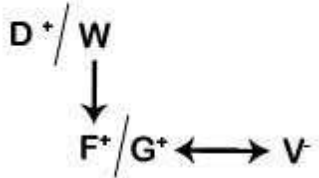
X * S @ @ T # C



26. A

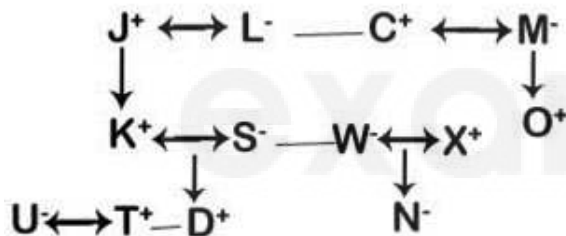
D % % F # W ; F & V

V is the female married to G



27. E 28. A

Solution (29-30)



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29. D 30. E

Solutions (31-35):

31. B

If at the checkout, the person selects cash on delivery then the order will be placed directly and the steps in between will not be applicable.

32. C

The product will be added to cart only if it is available, so it is logically missing.

33. E

It is up to the portal to decide that after which step it will need the shipping details. After d. , payment gateway should come only.

But shipping details can be asked after A, B or before C.

34. B

Out of the given options, Valid payment details are very much necessary for successful order placed.

35. D

The options for payment should be present because on it, depends the further steps. Like if cash of payment then after checkout, direct order placed. If any wallet option is there then logging to that wallet. And so on

Solution (36-40)

36. D

$$\$ \$ @ @ @ \$ = 110001$$

$$= (1 \times 2^5) + (1 \times 2^4) + (0 \times 2^3) + (0 \times 2^2) + (0 \times 2^1) + (1 \times 2^0) = 49$$

$$\$ @ @ @ @ @ @ = 1000000$$

$$1000000 = (1 \times 2^6) + (0 \times 2^5) + (0 \times 2^4) + (0 \times 2^3) + (0 \times 2^2) + (0 \times 2^1) + (0 \times 2^0) = 64$$

$$\$ @ @ @ @ @ @ \$ = 10000001$$

$$(1 \times 2^7) + (0 \times 2^6) + (0 \times 2^5) + (0 \times 2^4) + (0 \times 2^3) + (0 \times 2^2) + (0 \times 2^1) + (1 \times 2^0) = 129$$

$$\text{Hence, total sum} = 49 + 64 + 129 = 242$$

2	242	
2	121	0
2	60	1
2	30	0
2	15	0
2	7	1
2	3	1
2	1	1

Hence, 242 will be coded as 11110010 ie \$\$\$\$@@\$@

[::0 is written as @ and 1 is written as \$]

37. C

2	98	
2	49	0
2	24	1
2	12	0
2	6	0
2	3	0
	1	1

Hence, code for 98 will be 1100010, ie \$\$@@@\$@

38. A

$\$@\$@\$\$\$ = 10101111 = (1 \times 2^7) + (0 \times 2^6) + (1 \times 2^5) + (0 \times 2^4) + (1 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (1 \times 2^0) = 175$

39. B

$95 + 26/2 - 35/7$

$= 95 + 13 - 5$

$= 108 - 5$

$= 103$

2	103	
2	51	1
2	25	1
2	12	1
2	6	0
2	3	0
	1	1

Hence, code for 103 will be 1100111 i.e \$\$@@\$\$\$

40. A

Since 1 is written as \$, the code which will end with \$ will give odd number as a result. Obviously, it is option (a)

Solutions (41-45):

41. C

c is the correct option as No information is given about option a,b and d in the data flow diagram.

42. D

d is the correct option and a. cannot be the correct answer because when he will go to office after the challan, it will take some time. But in option d he will go to office by showing his DI to traffic police and he will reach at right time.

No information is given about b. from the data flow diagram.

43. D

Both a and c are correct option as they are logically valid in the case of data flow diagram. e is not a logically valid documents. No information is given about b. in the data flow diagram.

44. E

No information is given about all options in the data flow diagram, so e. is the correct answer.

45. B

b is the logically valid statement .a and c cannot be assumed as no clear information is given from the data flow diagram.

Solution (46-50)

46. C

Since 0 is written as @, the code which will end with @ will give even number as a result. Obviously, it is option C

47. E

$$\begin{array}{r|l} 2 & 139 & 1 \\ 2 & 69 & 1 \\ 2 & 34 & 0 \\ 2 & 17 & 1 \\ 2 & 8 & 0 \\ 2 & 4 & 0 \\ 2 & 2 & 0 \\ & 1 & \end{array} \quad 139_{10} = 10001011_2$$

Hence, code for 139 will be 10001011, ie \$@@@\$@\$

48. A

$$1110011 = (1 \times 2^6) + (1 \times 2^5) + (1 \times 2^4) + (0 \times 2^3) + (0 \times 2^2) + (1 \times 2^1) + (1 \times 2^0) = 115$$

$$100110 = (1 \times 2^5) + (0 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (0 \times 2^0) = 38$$

$$1000000 = (1 \times 2^6) + (0 \times 2^5) + (0 \times 2^4) + (0 \times 2^3) + (0 \times 2^2) + (0 \times 2^1) + (0 \times 2^0) = 64$$

$$\text{Then, } 115 + 38 + 64 = 217$$

BOOST UP PDFS | Reasoning Ability | Miscellaneous Questions
(New Pattern Questions Part-1)

Recommend for SBI PO, SBI Clerk, IBPS RRB/PO/Clerk Exams

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2	217	
2	108	1
2	54	0
2	27	0
2	13	1
2	6	1
2	3	0
	1	1

Hence, code for 217 will be 11011001, ie \$\$@\$\$@@\$

49. B

$$\text{\$}\text{\$}\text{\$}\text{\$}\text{\$}\text{\$}\text{\$} = 1111111 = (1 \times 2^6) + (1 \times 2^5) + (1 \times 2^4) + (1 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (1 \times 2^0) = 127$$

50. D

$$? \times 1.60 = (1/2) \times 274 - 45 \times 1.8,$$

$$= 137 - 81 = 56$$

$$? = 56/1.6 = 35 \text{ (100011)}$$

2	35	
2	17	1
2	8	1
2	4	0
2	2	0
	1	0

Hence, code for 35 will be 100011 i.e \$@@@\$\$

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Direction (1-20): What should come in place of the question mark (?) in the following questions?

1. $4376 + 3209 - 1784 + 97 = 3125 + ?$

- a. 2713
- b. 2743
- c. 2773
- d. 2793
- e. 2737

2. $555.05 + 55.50 + 5.55 + 5 + 0.55 = ?$

- a. 621.65
- b. 655.75
- c. 634.85
- d. 647.35
- e. None of these

3. $3251 + 587 + 369 - ? = 3007$

- a. 1250
- b. 1300
- c. 1375
- d. 1400
- e. None of these

4. $5.35 + 4.43 + 0.45 + 45.34 + 534 = ?$

- a. 597.27
- b. 589.57

c. 596.87

d. 596.67

e. None of these

5. $1234.131 - 93.12 - 431.1 - ? = 8.432$

- a. 411.072
- b. 369.497
- c. 701.479
- d. 356.479

e. 405.521

6. $1187 + 328 - 615 + 999 = ? + 730$

- a. 1039
- b. 1169
- c. 1069
- d. 1201
- e. 1379

7. $8888 - 88 - 888 + 8 + 88888 = ?$

- a. 82608
- b. 96808
- c. 110568
- d. 98888
- e. 97088

8. $235.4 + 371.8 + 253.8 = ?$

- a. 851

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b. 881

c. 861

d. 867

e. 651

9. $496.932 + 476.16 - 439.18 - 132.693 = ?$

a. 410.219

b. 400.219

c. 419.219

d. 401.219

e. 432.219

10. $49.937 + 23.124 - 32.768 - 38.439 = ?$

a. 1.874

b. 1.934

c. 1.854

d. 1.826

e. 1.834

Direction (11-20): What should come in place of the question mark (?) in the following questions?

11. $396.132 - 498.695 + 493.12 - 229.1 = ?$

a. 191.457

b. 261.457

c. 190.457

d. 160.457

e. 161.457

12. $7802 + 132 - 8963 + 1326 = ? \times 33$

a. 6

b. 12

c. 21

d. 9

e. 14

13. $14 \times 21 + 16 \times 28 - 14 \times 15 + 18 \times 13 = x$

a. 766

b. 822

c. 752

d. 887

e. 793

14. $\frac{3}{9} \times 2286 + \frac{2}{11} \times 1397 = ?$

a. 916

b. 1016

c. 1216

d. 1026

e. 1256

15. $6666 \div 66 \div 0.25 = ?$

a. 101

b. 404

c. 304

d. 40.4

e. None of these

16. $2\frac{1}{7} + 4\frac{3}{5} - 3\frac{1}{7} + 5\frac{1}{10} = ?$

a. $9\frac{7}{10}$

b. $7\frac{7}{10}$

c. $8\frac{7}{10}$

d. $8\frac{4}{10}$

e. None of these

17. $164 \times 43 - 6070 = ?$

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a. 682

b. 792

c. 882

d. 1082

e. 982

18. $19.9 \times 16.1 \times 17.2 = ?$

a. 5869.01

b. 3021.861

c. 5510.708

d. 4862.961

e. None of these

19. $49 \div 0.7 - 4.9 = ?$

a. 63.2

b. 65.1

c. 57.8

d. 69.3

e. None of these

20. $9898 + 1773 - 1882 \times 3 \div 2 = ?$

a. 7320

b. 8989

c. 8848

d. 9100

e. 7963

Direction (21-30): What should come in place of the question mark (?) in the following questions?

21. $2 \frac{1}{4} + 3 \frac{5}{6} - 4 \frac{1}{5} + 3 \frac{2}{3} - 2 \frac{3}{10} = x$

a. $3 \frac{1}{4}$

b. $4 \frac{1}{5}$

c. $3 \frac{1}{6}$

d. $4 \frac{1}{15}$

e. $4 \frac{1}{12}$

22. $4 \frac{2}{5} + 2 \frac{3}{7} - 3 \frac{2}{3} + 5 \frac{1}{6} - 3 \frac{3}{10} = x$

a. $4 \frac{1}{35}$

b. $5 \frac{1}{21}$

c. $6 \frac{1}{21}$

d. $5 \frac{1}{35}$

e. None of these

23. $8^{1.4} \times 4^{1.7} \times 16^{0.2} = 2^?$

a. 5.9

b. 7.2

c. 8.4

d. 6.7

e. None of these

24. $1225 \div 15 + 223 - (100 - 87) = ?$

a. 292

b. 289

c. 301

d. 187

e. None of these

25. $4325.6 + 659.6 - 543.3 + 3478 - 0.005 = ?$

a. 7920

b. 6570

c. 5643

d. 8785

e. None of these

26. $(441/?) = (?/3364)$

a. 1218

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- b. 1456
- c. 2457
- d. 6546
- e. None of these

27. $(13824)^{1/3} + (5776)^{1/2} = x2$

- a. 20
- b. 100
- c. 15
- d. 10
- e. None of these

28. $6/9 + 7/6 - 1/3 = ?$

- a. $3/2$
- b. $2/3$
- c. $3/7$
- d. $13/5$

- e. None of these

29. $(550/25) \times (2232/17) \times (2074/9) = ? \times 22$

- a. 30256
- b. 40657
- c. 34934
- d. 34678
- e. None of these

30. $1311 \div 1.9 + 8525 \div 625 = ?$

- a. 603.64
- b. 703.64
- c. 584.46
- d. 684.64
- e. 608.68

Direction (31-40): What should come in place of the question mark (?) in the following questions?

31. $702 \div 27 + 108 \times 0.75 = ?$

- a. 79
- b. 89
- c. 98
- d. 107
- e. 99

32. $348 \times 9 \times ? = 37584$

- a. 11
- b. 12
- c. 14
- d. 16
- e. None of these

33. $1234.131 - 93.12 - 431.1 - ? = 8.432$

- a. 411.072
- b. 369.497
- c. 701.479
- d. 356.479
- e. 405.521

34. $704 \times 710 + 112 \times 108 = ?$

- a. 499840
- b. 511936
- c. 519136
- d. 511396
- e. None of these

35. $21.2 \times 21.2 \times 21.2 = ?$

- a. 9582.128
- b. 9528.128

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- c. 5928.128
d. 9528.218
e. None of these

36. $(9884 \div 35.3) \times 1.5 + 493.19 = ?$

- a. 913.19
b. 912.43
c. 916.83
d. 919.41
e. 920.51

37. $49.937 + 23.124 - 32.768 - 38.439 = ?$

- a. 1.874
b. 1.934
c. 1.854
d. 1.826
e. 1.834

38. $396.132 - 498.695 + 493.12 - 229.1 = ?$

- a. 191.457
b. 261.457
c. 190.457
d. 160.457
e. 161.457

39. $25600 \div 16 \div 16 = ?$

- a. 256
b. 100
c. 56
d. 4056
e. None of these

40. $9600 \times (5/16) \times (6/24) \times (27/6) = ?$

- a. 3735

b. 3575

c. 3375

d. 5373

e. None of these

Direction (41-50): What should come in place of the question mark (?) in the following questions?

41. $43 \times 48 \times 5 \div ? = 120$

- a. 89
b. 86
c. 88
d. 84
e. 82

42. $22480 \div 281 \times 34 + ? = 2933$

- a. 225
b. 209
c. 211
d. 213
e. 207

43. $15 \times (1/4) + 32 \times (1/3) + 12 \times (3/4) \times 7 \times (1/17) = ? + 13 \times (1/4)$

- a. $123 \times (1/3)$
b. $124 \times (3/4)$
c. $122 \times (1/4)$
d. $124 \times (1/3)$
e. $124 \times (1/12)$

44. $3.6 \times 1.5 + 4.4 \times 2.5 - 1.2 \times 2.8 = ?$

- a. 13.04
b. 17.46
c. 16.04

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d. 15.40

e. 11.04

45. $160 \div 12.5 \times 4.5 + 34.2 \times 3.4 = ?$

a. 173.188

b. 120.4

c. 320.04

d. 220.04

e. 221.04

46. $14580 \div 54 \div 12 = ?$

a. 26.5

b. 22.5

c. 22.05

d. 25

e. 23.5

47. $139.99 - 148.39 + 25.66 + 31.396 = ?$

a. 48.686

b. 48.656

c. 49.456

d. 47.656

e. 46.456

48. $348 \times 9 \times ? = 37584$

a. 11

b. 12

c. 14

d. 16

e. None of these

49. $(4721 + 3271 + 5324) \div (491 + 769 + 132) = ?$

a. 40

b. 20

c. 25

d. 10

e. 15

50. $(3/9) \times 2286 + (2/11) \times 1397 = ?$

a. 1256

b. 1016

c. 1216

d. 1026

e. 1916

Answer with Solution

Solution (1-10)

1. C

$? = 7682 - 4909 = 2773$

2. A

$? = 555.05 + 55.50 + 5.55 + 5 + 0.55 = 621.65$

3. E

$? = 4207 - 3007 = 1200$

4. B

$? = 589.57$

5. C

$= 1234.131 - 93.12 - 431.1$

$= (1234.131 - 532.652) = 701.479$

6. B

$? = 1187 + 328 - 615 + 999 - 730$

$? = 1169$

7. B

$8888 - 88 - 888 + 8 + 88888 = ?$

$? = 96808$

8. C

$$?= 861$$

9. D

$$? = 496.932 + 476.16 - 439.18 - 132.693 = 973.092 - 571.873 = 401.219$$

10. C

$$?= 73.061 - 71.207$$
$$= 1.854$$

Solution (11-20)

11. E

$$?= 889.252 - 727.795$$
$$= 161.457$$

12. D

$$9260 - 8963 = ? \times 33$$
$$? = 29733 \div 9$$

13. A

$$294 + 448 - 210 + 234 = 766$$

14. B

$$762 + 254 = 1016$$

15. B

$$6666 \times 1/66 \times 1/0.25 = ?$$
$$? = 404$$

16. C

$$(2+4+5-3) + \left(\frac{1}{7} + \frac{3}{5} + \frac{1}{10} - \frac{1}{7}\right)$$
$$= 8 + \frac{10+42+7-10}{70}$$
$$= 8 + \frac{49}{70} = 8\frac{49}{70}$$
$$= 8\frac{7}{10}$$

17. E

$$7052 - 6070 = ?$$
$$? = 982$$

18. C

$$? = 19.9 \times 16.1 \times 17.2 = 5510.708$$

19. B

$$? = 49 \div 0.7 - 4.9 = 49 \div (7/10) - 4.9$$
$$= 49 \times 10/7 - 4.9 = 70 - 4.9 = 65.1$$

20. C

$$?= 9898 + 1773 - 1882 \times 3 \div 2$$
$$= 9898 + 1773 - 941 \times 3$$
$$= 11671 - 2823 = 8848$$

Solution (21-30)

21. A

$$2 + 3 - 4 + 3 - 2 + (1/4 + 5/6 - 1/5 + 2/3 - 3/10)$$
$$= 2 + 15/12 = 2 + 1 + 3/12 = 3 + 1/4 = 3\frac{1}{4}$$

22. D

$$4 + 2 - 3 + 5 - 3 + (2/5 + 3/7 - 2/3 + 1/6 - 3/10)$$
$$= 5 + 1/35 = 5\frac{1}{35}$$

23. C

$$2^{4.2} \times 2^{3.4} \times 2^{0.8} = 2^{4.2+3.4+0.8}$$
$$= 2^{8.4}$$

24. A

$$= 1225 \div 15 + 223 - 13$$
$$= 81.7 + 223 - 13$$
$$= 291.7 = 292$$

25. A

$$8463.2 - 543.305$$
$$= 7919.89$$

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$$= 7920$$

26. A

$$21 \times 58 = 1218$$

27. D

$$24 + 76 = 100$$

28. A

$$(12 + 21 - 6) / 18 = 27 / 18 = 3/2$$

29. A

$$22 \times 248 \times 122 = 665632$$

$$665632 / 22 = 30256$$

30. B

$$? = 1311 \div 1.9 + 8525 \div 625$$

$$= 690 + 13.64 = 703.64$$

Solution (31-40)

31. D

$$? = (702 / 27) + 108 \times \frac{3}{4} = 26 + 81 = 107$$

32. B

$$? = 37584 / (9 \times 348) = 12$$

33. C

$$? = 1234.131 - 93.12 - 431.1$$

$$= (1234.131 - 532.652) = 701.479$$

34. B

$$? = (704)^2 + 704 \times 6 + (108)^2 + 108 \times 4$$

$$= 495616 + 4224 + 11664 + 432 = 511936$$

35. B

$$? = (21.2)^3 = 9528.128$$

36. A

$$? = [(9884 / 353) \times 10] \times 15 / 10 + 493.19$$

$$= (280) \times 15 / 10 + 493.19 = 420 + 493.19$$

$$= 913.19$$

37. C

$$? = 73.061 - 71.207$$

$$= 1.854$$

38. E

$$? = 889.252 - 727.795$$

$$= 161.457$$

39. B

$$? = 25600 \times \frac{1}{16} \times \frac{1}{16}$$

$$= 25600 \times \frac{1}{256} = 100$$

40. C

$$? = 9600 \times \frac{5}{16} \times \frac{6}{24} \times \frac{27}{6} = 3375.$$

Solution (41-50)

41. B

$$43 \times 48 \times 5 \div ? = 120$$

$$\text{Or, } 10320 / ? = 120$$

$$? = 10320 / 120$$

$$= 86$$

42. D

$$22480 \div 281 \times 34 + ? = 2933$$

$$\text{Or, } 80 \times 34 + ? = 2933$$

$$\text{Or, } 2720 + ? = 2933$$

$$\text{Or, } ? = 2933 - 2720 = 213$$

43. D

$$? + 13 \times (1/4) = (61/4) + (97/3) + (51/4) \times (120/17)$$

$$= (61/4) + (97/3) + 90 = (183 + 388 + 1080) / 12 = 1651 / 12$$

$$\text{Or, } ? = (1651 / 12) - (53/4) = (1651 - 159) / 12 = 1492 / 12$$

$$= 124 \times (4/12) = 124 \times (1/3)$$

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44. A

$$?=3.6 \times 1.5 + 4.4 \times 2.5 - 1.2 \times 2.8$$

$$= 5.4 + 11 - 3.36$$

$$= 16.4 - 3.36$$

$$= 13.04$$

45. A

$$?=(160/12.5) \times 4.5 + 34.2 \times 3.4$$

$$= 12.8 \times 4.5 + 34.2 \times 3.4$$

$$= 57.6 + 116.28$$

$$= 173.88$$

46. B

$$?=(14580)/(54 \times 12) = 22.5$$

47. B

$$?=(139.99+31.396+25.66)-148.39$$

$$= 197.046 - 148.39 = 48.656$$

48. B

$$? = 37584 / (9 \times 348) = 12$$

49. D

$$?=(4721+3271+5324) \div (491+769+132)=13316 \div 1392 \approx$$

$$13400 \div 1400 = 9.5 \approx 10$$

50. B

$$?=(3/9) \times 2286 + (2/11) \times 1397$$

$$= 3 \times 254 + 2 \times 127$$

$$= 762 + 254$$

$$= 1016$$

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Direction (1-10): What should come in place of the question mark (?) in the following questions?

1. $3/7$ of 329 + $4/11$ of 2530 = $\sqrt{?} + 894$

- a. 28899
- b. 29899
- c. 27789
- d. 27889
- e. None of these

2. $\sqrt{?} + 14 = \sqrt{2601}$

- a. 1521
- b. 1369
- c. 1225
- d. 961
- e. 1296

3. 85% of 420 + ?% of 1080 = 735

- a. 25
- b. 30
- c. 35
- d. 40
- e. 45

4. 30% of 1225 – 64% of 555 = ?

- a. 10.7
- b. 12.3

c. 13.4

d. 17.5

e. None of these

5. 156% of 780 - $2/5$ of 480 + 85% of 540 = ?

- a. 1388.5
- b. 1483.8
- c. 1488.8
- d. 1538.8

e. None of these

6. $(12)^{3/2} \times (36)^{5/2} \times (144)^{3/2} \div (12)^? = 1728$

- a. $7/2$
- b. $5/2$
- c. 6
- d. 5
- e. 4

7. 16% of 80 + ?% of 44 = 34.8

- a. 55
- b. 50
- c. 60
- d. 40
- e. 70

8. 85% of 95% of $4/5$ of 2240 = ?

- a. 1447.04

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b. 1457.04

c. 1449.07

d. 1449.05

e. 1447.004

9. $(19\% \text{ of } 361) \div 1.9 = ?$

a. 391

b. 361

c. 36.1

d. 39.1

e. 3.61

10. $(\sqrt[3]{12167}) \times (\sqrt[3]{274625}) \times (\sqrt[3]{250047}) = ?$

a. 98956

b. 78695

c. 87695

d. 94185

e. 94565

Direction (11-20): What should come in place of the question mark (?) in the following questions?

11. $22\% \text{ of } 44\% \text{ of } 66\% \text{ of } 275000 = ?$

a. 14968.2

b. 16669.2

c. 17869.2

d. 17569.2

e. 15869.2

12. $5.2\% \text{ of } 3900 - 4.8\% \text{ of } 3400 = ?$

a. 39.6

b. 45.4

c. 35.2

d. 42.4

e. 36.6

13. $45\% \text{ of } 600 + ?\% \text{ of } 480 = 390$

a. 20

b. 25

c. 30

d. 40

e. None of these

14. $65\% \text{ of } 240 + ?\% \text{ of } 150 = 210$

a. 45

b. 46

c. 32

d. 36

e. None of these

15. $\sqrt[3]{9261} \times \sqrt[3]{62742241} = ? + 89$

a. 166254

b. 166259

c. 166253

d. 166252

e. None of these

16. $(1089)^{1/2} \times 1331 = 121 \times ?$

a. 443

b. 673

c. 363

d. 303

e. None of these

17.

$(854 \times 854 \times 854 - 276 \times 276 \times 276) / (854 \times 854 + 854 \times 276 + 276 \times 276) = ?$

- a. 1130
- b. 578
- c. 565
- d. 1156
- e. None of these

18. $56\% \text{ of } 225 + 20\% \text{ of } 150 = ? - 109$

- a. 49
- b. 103
- c. 53
- d. 47
- e. None of these

19. $\sqrt{75 + \sqrt{31 + \sqrt{16 + \sqrt{81}}}} \times \sqrt{729} = \sqrt{?} \times 18$

- a. 27^2
- b. 13.5
- c. 14^2
- d. 182.25
- e. $(19.6)^2$

20. $\frac{27^{2.3} \times 81^{2.6} \times 27^{46.3}}{27^{5.3}} = 27^{0.1} \times 3^?$

- a. 0.3
- b. 2.3
- c. 140
- d. 140.3
- e. None of these

Direction (21-25): What should come in place of the question mark (?) in the following questions?

21. $\frac{3}{8} \text{ of } \frac{4}{9} \text{ of } 1575 + (\sqrt{?}) - 32\% \text{ of } 786 = 66.98$

- a. $\sqrt{56}$
- b. 56
- c. $(56)^2$
- d. 36
- e. None of these

22. $(2^3)^3 \times (2^2)^2 \times (8^2)^{3/2} / (2^2)^6 = (4)^?$

- a. 8
- b. 10
- c. 2.5
- d. 6
- e. 5

23. $(4 \times 18)^{3.35} \times (8)^{5.2} \times (64)^{7.3} \times (27 \times 3)^{9.9} = (72)^?$

- a. 23.15
- b. 24.15
- c. 3.35
- d. 7.3
- e. 20.75

24. $8\sqrt{8} \times 8^3 \div 8^{5/2} = 2^?$

- a. 24
- b. 12
- c. 18
- d. 21
- e. None of these

25. $30\% \text{ of } (2/7) \text{ of } (2/9) \text{ of } (2/5) \text{ of } (2/3) \text{ of } 9450 = ?$

- a. 32
- b. 36

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- c. 42
- d. 48
- e. 52

Directions (26-35): What approximate value should come in place of question mark (?) in each of the following questions? (Note: You are not expected to calculate the exact value).

26. $6575 \div 74.95 + \sqrt{630} \times 14.83 = ?$

- a. 550
- b. 463
- c. 320
- d. 256
- e. 680

27. $198.05 \times 126.05 \div 76.87 + 178.44 - 294.77 = ?$

- a. 324
- b. 315
- c. 295
- d. 154
- e. 207

28. $0.5\% \text{ of } 4789.823 + 0.7\% \text{ of } 330.732 = ?$

- a. 42
- b. 26
- c. 35
- d. 20
- e. 17

29. $8.99 \times 8.99 \times 8.99 \div 2.99 = 3^?$

- a. 7
- b. 9

- c. 3
- d. 2
- e. 5

30. $14.982^2 \div 5.001^2 \times 4.990 \times 5^{-1} = ?$

- a. 45
- b. 75
- c. 225
- d. 9
- e. 25

31. $2831.994 \div 23.998 + 11.99^2 \div 5.991 = ?^2$

- a. 144
- b. 12
- c. 196
- d. 14
- e. 17

32. $(22.99 + 17.01) \div 1.998 \times 3.997 - 41.998 + 644.199 = ?$

- a. 798
- b. 542
- c. 682
- d. 745
- e. 762

33. $50.01^2 + 19.999^2 + ? = 50.998^2$

- a. - 363
- b. - 299
- c. 63
- d. 299
- e. - 489

34. $(4721+3271+5324) \div (491+769+132) = ?$

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a. 40

b. 20

c. 25

d. 10

e. 15

35. 205% of 3850 – 105% of 2640 = ?

a. 4218.5

b. 5120.5

c. 5448.5

d. 4628.5

e. 5035.5

Direction (36-50): What should come in place of the question mark (?) in the following questions?

36. $[5438 - 2784 - 659] \div [820 - 56 - 41] = ?$

a. 6

b. 9

c. 27

d. 3

e. 12

37. $6\frac{2}{3} + 19.28 + 5\frac{1}{4} + 7\frac{1}{6} - 7.592 = ?$

a. 30

b. 36

c. 40

d. 38

e. 42

38. $6 \cdot (37.99)^2 - (11.081)^2 + (6.89)^3 + (4)^2 = (?)^2$

a. 41

b. 39

c. 43

d. 36

e. 37

39. $14.891 \div 9 \times 1638 \times 18.8801 \div 7 \times (3)^3 \div 13 = ?$

a. 15,000

b. 14,900

c. 16,500

d. 15,390

e. 15,600

40. $(7.9899 \times 7.002) + \sqrt{1024.78} + (1.99086)^3 = ? \div 1/5.7865$

a. 576

b. 480

c. 16

d. 18

e. 516

41. 5.5% of 225 + 7.5% of 625 - 18.6% of 182 = ?

a. 16

b. 14

c. 19

d. 25

e. 18

42. $(5.96)^2 + (7.89)^2 + (2.9)^2 + (3.1)^2 = (2.42)^2 + (2.68)^2 + ?$

a. 105

b. 108

c. 107

d. 106

e. 110

43. $\sqrt[3]{250047.99} \times 240\% \text{ of } 629.49 = ?$

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a. 83249

b. 114898

c. 78632

d. 104863

e. 95256

44. $2377.632 \div 18.05 - 4.56 \times 8.001 = ?$

a. 110

b. 106

c. 88

d. 92

e. 96

45. $8.23^3 + 8^3 + 8.91^2 + (64.021)^{1/2} = ?$

a. 1095

b. 1113

c. 5184

d. 1200

e. None of these

46. $\sqrt{527.995} + (9.9161)^2 + (11.296)^2 = ? \div 0.008 / 2$

a. 4

b. 8

c. 1

d. 5

e. 2

47. $0.85\% \text{ of } 805 + 2.25\% \text{ of } 225 + 2.03\% \text{ of } 203 = ?$

a. 14

b. 11

c. 18

d. 16

e. 12

48. $1584 \div 24.89\% \text{ of } 352.02 = ?$

a. 24

b. 18

c. 12

d. 28

e. 8

49. $18\% \text{ of } 256 + 35\% \text{ of } 290 - 15\% \text{ of } 385 = ?$

a. 83

b. 80

c. 90

d. 70

e. 85

50. $63.9\% \text{ of } 8920.2 + ?\% \text{ of } 5320.3 = 6830.162$

a. 36

b. 21

c. 17

d. 31

e. 9

Answer with Solution

Solution (1-10)

1. D

$$141 + 920 = \sqrt{?} + 894$$

$$\sqrt{?} = 167$$

$$? = 27889$$

2. B

$$\sqrt{?} = \sqrt{2601} - 14 = 51 - 14 = 37$$

$$? = 1369$$

3. C

$$85/100 \times 420 + x/100 \times 1080 = 735$$

$$\Rightarrow x = 35$$

4. B

$$? = 367.5 - 355.2$$

$$= 12.3$$

5. B

$$? = 156 \times 7.80 - (2/5) \times 480 + 85 \times 5.40$$

$$= 1216.8 - 192 + 459$$

$$= 1675.8 - 192 = 1483.8$$

6. E

$$(64 \times 27) \times 4 \times 3 \times 4^3 \times 3^3 / 1728 = 12^?$$

$$4^4 \times 3^4 = 12^?$$

$$(12)^4 = 12^?$$

$$? = 4$$

7. B

$$(16 \times 80) / 100 + (? \times 44) / 100 = 34.8$$

$$? \times 44 / 100 = 34.8 - 12.8 = 22$$

$$? = (22 \times 100) / 44 = 50$$

8. A

$$? = (85/100) \times (95/100) \times (4/5) \times 2240$$

$$= (17 \times 19 \times 4 \times 112) / 100$$

$$= 144704 / 100 = 1447.04$$

9. C

$$? = (19 \times 361 \times 10) / (100 \times 19)$$

$$= (19 \times 19) / 10 = 36.1$$

10. D

$$? = (\sqrt[3]{12167}) \times (\sqrt[3]{274625}) \times (\sqrt[3]{250047})$$

$$= 23 \times 65 \times 63 = 94185$$

Solution (11-20)

11. D

$$? = (275000 \times 22 \times 44 \times 66) / (100 \times 100 \times 100)$$

$$= (275 \times 22 \times 44 \times 66) / (10 \times 100) = 17569.2$$

12. A

$$? = (5.2\% \text{ of } 3900) - (4.8\% \text{ of } 3400)$$

$$= [(5.2 \times 3900) / 100] - [(4.8 \times 3400) / 100]$$

$$= (5.2 \times 39) - (4.8 \times 34)$$

$$= 202.8 - 163.2 = 39.6$$

13. B

$$45/100 \text{ of } 600 + ?/100 \text{ of } 480 = 390$$

$$\Rightarrow 270 + 4.8 \times ? = 390$$

$$? = 390 - 270 / 4.8$$

$$= 25$$

14. D

$$65/100 \text{ of } 240 + ?/100 \text{ of } 150 = 210$$

$$\Rightarrow 156 + 1.5 \times ? = 210$$

$$\therefore ? = 210 - 156 / 1.5 = 36$$

15. D

$$? = 21 \times 7921 - 89$$

$$= 166252$$

16. C

$$? = 33 \times 1331 / 121$$

$$= 363$$

17. B

$$? = (854^3 - 276^3) / (854^2 + 854 \times 276 + 276^2)$$

$$\text{By applying } a^3 - b^3 = (a-b) / (a^2 + ab + b^2)$$

$$= 854 - 276$$

$$= 578$$

18. E

$$? = 126 + 30 + 109$$

$$= 265$$

19. D

$$\sqrt{75 + \sqrt{31 + \sqrt{16 + \sqrt{81}}}} = 9 \text{ and } \sqrt{729} = 27$$

$$\therefore \frac{9 \times 27}{18} = \sqrt{?}$$

$$\text{Hence, } \sqrt{?} = (13.5)^2$$

$$\therefore ? = 182.25$$

20. C

$$\frac{27^{2.3} \times 81^{2.6} \times 27^{46.3}}{27^{5.3}} = 27^{0.1} \times 3^7$$

$$\frac{(3^3)^{2.3} \times (3^4)^{2.6} \times (3^3)^{46.3}}{(3^3)^{5.3}} = (3^3)^{0.1} \times 3^7$$

$$\frac{3^{156.2}}{3^{15.9}} = (3^3)^{0.1} \times 3^7$$

$$3^{0.3+?} = 3^{140.3}$$

$$\therefore ? = 140.3 - 0.3 = 140$$

Solution (21-25)

21. C

$$3/8 \times 4/9 \times 1575 + (\sqrt{?}) - 32\% \text{ of } 786 = 66.98$$

$$1/2 \times 525 + (\sqrt{?}) - (32/100) \times 786 = 66.98$$

$$262.5 (100) + (\sqrt{?}) (100) - 25152 = 66.98(100)$$

$$26250 - 25152 + (\sqrt{?}) (100) = 6698$$

$$(\sqrt{?}) (100) = 5600$$

$$? = (56)^2$$

22. E

$$(2^3)^3 \times (2^2)^2 \times (8^2)^{3/2} / (2^2)^6 = (4)^?$$

$$(4)^? = 2^9 \times 2^4 \times 8^3 / 2^{12}$$

$$(4)^? = 2^{13-12} \times 8^3$$

$$(4)^? = (4)^5$$

$$? = 5$$

23. A

$$(72)^? = (4 \times 18)^{3.35} \times (8)^{5.2} \times (64)^{7.3} \times (27 \times 3)^{9.9}$$

$$(72)^? = (4 \times 2 \times 9)^{3.35} \times (8)^{5.2} \times (8 \times 8)^{7.3} \times (9 \times 9)^{9.9}$$

$$(72)^? = (8)^{3.35+5.2+7.3+7.3} \times (9)^{3.35+9.9+9.9}$$

$$(72)^? = (72)^{23.15}$$

24. E

$$8\sqrt{8} \times 8^3 \div 8^{5/2} = 2^?$$

$$8^{1+1/2+3-5/2} = 2^?$$

$$8^{(2+1+6-5)/2} = 2^?$$

$$8^{4/2} = 2^?: 8^2 = 2^?$$

$$? = 6$$

25. D

$$? = 30\% \text{ of } 2/7 \text{ of } 2/9 \text{ of } 2/5 \text{ of } 2/3 \text{ of } 9450$$

$$= 30\% \text{ of } [(16/945) \times 9450]$$

$$= 30\% \text{ of } 160 = 48$$

Solution (21-35)

26. B

$$6575 \div 74.95 + \sqrt{630} \times 14.83 = ?$$

$$88 + 25 \times 15 \approx ?$$

$$? = 463$$

27. E

$$? \approx 198 \times 126 \div 77 + 178 - 295$$

$$? = 198 \times 126 \times (1/77) + 178 - 295$$

$$? = 324 + 178 - 295$$

$$? = 207$$

28. B

$$0.5\% \text{ of } 4789.823 + 0.7\% \text{ of } 330.732 = ?$$

$$\text{or, } ? \approx 4790/200 + 331/100 \times (0.7) \approx 24 + 2 = 26$$

29. E

$$8.99 \times 8.99 \times 8.99 \div 2.99 = 3^?$$

$$9 \times 9 \times 9/3 \approx 3^?$$

$$9 \times 9 \times 3 = 3^5 = 3^?$$

30. D

$$14.982^2 \div 5.001^2 \times 4.990 \times 5^{-1} = ?$$

$$15^2/5^2 \times 5 \times 1/5 = ?$$

$$? = 3^2 = 9$$

31. B

$$2831.994 \div 23.998 + 11.99^2 \div 5.991 = ?^2$$

$$2832/24 + 12^2/6 \approx ?^2$$

$$118 + 24 = 144 = ?^2, ? = \pm 12$$

32. C

$$(22.99 + 17.01) \div 1.998 \times 3.997 - 41.998 + 644.199 = ?$$

$$(23 + 17)/2 \times 4 - 42 + 644 \approx ?$$

$$? = 20 \times 4 - 42 + 644$$

$$? = 80 + 644 - 42 = 724 - 42 = 682$$

33. B

$$50.01^2 + 19.999^2 + ? = 50.998^2$$

$$50^2 + 20^2 + ? \approx 51^2$$

$$? = 51^2 - 50^2 - 20^2$$

$$? = 2601 - 2500 - 400 = -299$$

34. D

$$? = (4721 + 3271 + 5324) \div (491 + 769 + 132) = 13316 \div 1392 \approx$$

$$13400 \div 1400 = 9.5 \approx 10$$

35. B

$$\begin{aligned} ? &= \frac{205}{100} \times 3850 - \frac{105}{100} \times 2640 \\ &= 7,892.5 - 2,772 \\ &= 5120.5 \end{aligned}$$

Solution (36-50)

36. D

$$[5438 - 2784 - 659] \div [820 - 56 - 41] = ?$$

$$? = 1995 / 723 = 2.759 \approx 3$$

37. A

$$6 \frac{2}{3} + 19.28 + 5 \frac{1}{4} + 7 \frac{1}{6} - 7.592 = ?$$

$$? = 20/3 + 19.28 + 21/4 + 43/6 - 7.592$$

$$\approx 19 + 19 - 8 = 30$$

38. A

$$(37.99)^2 - (11.081)^2 + (6.89)^3 + (4)^2 = (?)^2$$

$$(?)^2 = (38)^2 - (11)^2 + (7)^3 + (4)^2$$

$$(?)^2 = 1444 - 121 + 343 + 16 = 1682$$

$$? = \sqrt{1682} = \sqrt{1681} = 1681$$

39. D

$$14.891 \div 9 \times 1638 \times 18.8801 \div 7 \times (3)^3 \div 13 = ?$$

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$$= 15/9 \times 1638 \times 19/7 \times 27/13$$

$$= 15,390$$

40. C

$$(7.9899 \times 7.002) + \sqrt{1024.78} + (1.99086)^3 = ? \div 1/5.7865$$

$$(8 \times 7) + 32 + (2)^3 = ? \times 5.7865$$

$$(56 + 32 + 8) / 5.7865 \approx 96/6 = 16$$

41. D

$$? = 5.5\% \text{ of } 225 + 7.5\% \text{ of } 625 - 18.6\% \text{ of } 182$$

$$= 12.375 + 46.875 - 33.852$$

$$\approx 12 + 47 - 34 = 25$$

42. A

$$(2.42)^2 + (2.68)^2 + ? = (5.96)^2 + (7.89)^2 + (2.9)^2 + (3.1)^2 \approx$$

$$(6)^2 + (8)^2 + (3)^2 + (3)^2$$

$$\approx 36 + 64 + 9 + 9 = 118$$

$$\therefore ? = 118 - \{(2.42)^2 + (2.68)^2\}$$

$$= 118 - (5.86 + 7.18) \approx 118 - \{6 + 7\} = 118 - 13 = 105$$

43. E

$$? = \sqrt[3]{250047.99 \times 240\% \text{ of } 629.49}$$

$$\approx 63 \times (240/100) \times 630 = 95256$$

44. D

$$2377.632 \div 18.05 - 4.56 \times 8.001 = ?$$

$$2380/18 - 5 \times 8 = 132 - 40 = 92$$

45. B

$$8.23^3 + 8^3 + 8.91^2 + (64.021)^{1/2} = ?$$

$$= 8^3 + 8^3 + 9^2 + \sqrt{64}$$

$$= 512 + 512 + 81 + 8 = 1113$$

46. C

$$\sqrt{527.995} + (9.9161)^2 + (11.296)^2 = X \div 0.008 / 2$$

$$\sqrt{529} + (10)^2 + (11)^2 = X \times 2/0.008$$

$$23 + 100 + 121 = X \times 250$$

$$X = 244 / 250 \approx 1$$

47. D

$$0.85\% \text{ of } 805 + 2.25\% \text{ of } 225 + 2.03\% \text{ of } 203 = ?$$

$$= 0.85/100 \times 800 + 2.25/100 \times 225 + 2.03/100 \times 203$$

$$= 6.8 + 5.0625 + 4.06 = 15.9225$$

$$= 16$$

48. B

$$? \approx 1584 \div \frac{25}{100} \times 352$$

$$? \approx \frac{1584 \times 100}{25 \times 352}$$

$$? \approx 18$$

49. C

$$18\% \text{ of } 256 + 35\% \text{ of } 290 - 15\% \text{ of } 385 = ?$$

$$\text{or, } ? \approx \frac{18}{100} \times 260 + \frac{35}{100} \times 300 - \frac{15}{100} \times 400$$

$$= 46.8 + 105 - 60 = 151.8 - 60 = 91.8 \approx 90$$

50. B

$$\approx 63.9\% \text{ of } 8920 + ? \% \text{ of } 5320 = 6830$$

$$\approx 5320 \times ? = (6830 - 5709) \times 100$$

$$? \approx 21$$

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Direction (1-10): What should come in place of the question mark (?) in the following questions?

1. 62.5% of 800 – 33.33% of 960 = 125% of ?

- a. 120
- b. 144
- c. 165
- d. 180
- e. None of these

2. $(2)^5 \times (3^2)^3 \div (64)^3 = (40 \div 10)^{?+1}$

- a. 3
- b. 4
- c. 5
- d. 6
- e. None of these

3. $\sqrt{301 - \sqrt{168 - \sqrt{544 + \sqrt{1042 - \sqrt{324}}}}} = ? \div 3$

- a. 25
- b. 51
- c. 39
- d. 34
- e. 65

4. $48.3 \times 289 \div 3.4 \div 23 \div 68 \times 21 = ?^3 + 28.125$

- a. 5
- b. 3

c. 8

d. 11

e. None of these

5. $(21^2 - 3^9) \times (3^6 - 9^3) + 11^2 = ?$

a. 12251

b. 17781

c. 91641

d. 72361

e. None of these

6. If $X = 10$, $Y = 7$, then

$$\frac{(X - Y)^4 - 18}{7} \times \frac{9XY}{10Y^2 - 6XY} = ?$$

a. 44

b. 113

c. 66

d. 81

e. 69

7. $143^2 + 188^2 + 201^2 - 142^2 - 186^2 - 199^2 = ?$

a. 1833

b. 1783

c. 1567

d. 1098

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8. $(6\sqrt{6} \times 2\sqrt{3} \times 4\sqrt{2}) \div 12 = ? + 123 - 59$

- a.-75
- b.-40
- c. -80
- d.60
- e.None of these

9. $88555/89 + 4925/985 - 3\sqrt{6859} + \sqrt{441} = ?$

- a. 1000
- b. 1001
- c. 1002
- d.1003
- e.None of these

10. $36 \% \text{ of } 63621 + 63 * 89 - 532 * 95 + 4275/95 = ?$

- a. 21984.44
- b. 21884.44
- c. - 21984.44
- d.- 21884.44
- e.None of these

Direction (11-20): What should come in place of the question mark (?) in the following questions?

11. $3\sqrt{2197} * 594 - \sqrt{256} * 449 + 0.8 \% \text{ of } 590 = ?$

- a.532.72
- b.552.72
- c.524.72
- d.542.72
- e.None of these

12. $\sqrt{11025/15} * 1968 + 12632 - 1262 * 23 = ?$

- a.- 2610

b.2610

c.-2618

d.- 2608

e.None of these

13. $526 * 24 + 224 * 28 - 198 * 23 - 608 = ?$

a.13734

b.13735

c.13634

d.13374

e.None of these

14. $(562 - 252) * 1/31 + ? \% \text{ of } 100 = 150 + (562 * 1.62)$

a.989.44

b.969.44

c.959.44

d.919.44

e.None of these

15. $(3380 * 46/52) + 384 - (1832 * 3/4) = ? + 3\sqrt{12167} * \sqrt{4761}$

a.413

b.423

c. 453

d.433

e.None of these

16. $1625 * 222 * 3.8 - 622256 = ? + 98 \% \text{ of } 56558$

a.696267.16

b.695267.16

c.693167.16

d.698767.16

e.None of these

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17. $9^6/27 * 2187/27^4 * 3^2 = 9/729 * 243/6561$

- a. 10
- b.- 10
- c.9
- d.- 12
- e.None of these

18. $\sqrt{6084} + \sqrt{2401} \times 8 - 144 + 658 = ?$

- a.984
- b.894
- c.948
- d.489
- e.none of these

19. Find the value of $1/(3 + 1/(3 + 1/(3 - 1/3)))$

- a.3/10
- b.10/3
- c.27/89
- d.89/27
- e. None of these

20. $\sqrt{10 + \sqrt{27 + \sqrt{65 + \sqrt{256}}}}$

- a.9
- b. 8
- c.6
- d.4
- e. None of these

Direction (21-25): What should come in place of the question mark (?) in the following questions?

21. $\sqrt{7396} \times 3375 = 225 \times ?$

- a. 1,250
- b. 1,290
- c. 1,270
- d. 1,300
- e. 1,232

22. 89 % of 624 + 1220 - $\sqrt{10404} - 1020 = ?$

- a.653.36
- b.663.36
- c.643.36
- d.673.36
- e.None of these

23. $(3.5 \times 3.5 \times 3.5 - 1.5 \times 1.5 \times 1.5) / (3.5 \times 3.5 + 1.5 \times 1.5 + 3 \times 3.5/2) = ?$

- a.0
- b.1
- c.3
- d.2
- e.None of these

24. $25/3 \times 22/5 + ? = 222/5$

- a.116/13
- b.116/15
- c.117/15
- d.116/13
- e.None of these

25. $1/7 + [7/9 - (3/2 + 2/9) - 2/9] = ?$

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- a. - 43/42.
- b. 44/42.
- c.- 43/43.
- d.44/43.
- e.None of these

Direction (26-50): What approximate value should come in place of question mark (?) in the following questions?

26. $(251.87 \times 8 \times 6.99) \div 25 = 11.986 + ?$

- a. 448
- b. 586
- c. 568
- d. 548
- e. 652

27. $1 \frac{1}{16.99}$ of 50.988 + ?% of 5500 = $41.992^2 + 49.99$

- a. 64
- b. 82
- c. 32
- d. 52
- e. 62

28. $\sqrt{7378} \times \sqrt{1330} \div \sqrt{660} = ?$

- a.250
- b.320
- c.120
- d.420
- e.150

29. $6999 \div 70.005 \times 94.998 = ? \times 19.999$

- a.575
- b.675
- c.475
- d.375
- e.275

30. 125% of 4875 + 88.005 x 14.995 =?

- a.7515
- b.7415
- c.7210
- d.7145
- e.7005

31. $\sqrt{1000} + \frac{3.001}{4.987}$ of 1891.992

- a.1166
- b.1530

- c.980
- d.685
- e.1130

32. $(?)^2 + (6.99)^3 = (19.99)^2 + (7.98)^2$

- a.11
- b.14
- c.13
- d.10

e. None of these

33. 84.789% of 479.983 – 26.01% of 349.98 – 3024.31 ÷ 35.998 = ?

- a.255
- b.285
- c.295

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d.235

e.205

34. $(5 * 7)\% \text{ of } (34 * 55) + 456.60 = 699.10 + ?$

a.510

b.610

c.410

d.310

e.210

35. $103.1\% \text{ of } 6401.01 - 3/7 \% \text{ of } 6300.12 + 11.999 = ?$

a.6597

b.6527

c.6777

d.5677

e.6577

36. $29.8\% \text{ of } 260 + 60.01\% \text{ of } 510 - 103.57 = ?$

a. 480

b.380

c.280

d.180

e.580

37. $\sqrt{120} \times \sqrt{530} + \sqrt{1681} + \sqrt{5330} = ?$

a.327

b.227

c.367

d.267

e.427

38. $11.12 \% \text{ of } 261 - 32.01 + 50.01 \% \text{ of } 3200 = ? /$

2.99

a.4761

b.4701

c.4791

d.4747

e.4737

39. $17.99^2 - 14.05^2 + (2343.75 + 81.55) \div ? = 229$

a.32

b.39

c.24

d.28

e.12

40. $36\% \text{ of } 545 + 32\% \text{ of } 215 - 47\% \text{ of } 1300 = ?$

a. 643

b. 346

c. -411

d. -346

e. -643

41. $\sqrt{6560} * 4.007 + 119.99 * 1.998 - 50.001\% \text{ of } 479.908 = ?$

a. 348

b. 324

c. 368

d. 372

e. 396

42. $19.99\% \text{ of } 789.907 * 15.08 + 111.999 \div 4.034 -$

45% of 399.998 = ?

a. 2220

b. 2290

c. 2190

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d. 1320

e. 2480

43. $699.989 \div 7.05 - 4.998 * 17.96 + 14.05 * 3.99 - 12.09 = ?$

a. 54

b. 60

c. 48

d. 42

e. 64

44.

$$[(5\sqrt{7} + \sqrt{7}) \times (4\sqrt{7} + 8\sqrt{7})] - (19)^2 = ?$$

a. 143

b. 134

c. 123

d. 134

e. 101

45. $5 (2/3)$ of 299.78 + 3 $(1/8)$ of 429.67 = ? % of 749.85

a. 384

b. 360

c. 448

d. 412

e. 490

46. 26% of 349.75 – 32% of 599.27 = ? – $157.94 - (27.21)^2$

a. 820

b. 568

c. 786

d. 634

e. 912

47. $(17.78)^2 + 23 \% \text{ of } 1299 - (5/12) \text{ of } 839 = ? - (9.72)^3$

a. 850

b. 1700

c. 1275

d. 2135

e. 2450

48. $34.99 * 3.04 + 80.03 \% \text{ of } 40.06 - 12.977 * 1.907 + ? = 45.06 * 3.009$

a. 20

b. 28

c. 18

d. 24

e. 30

49. $22 \frac{1}{3} \% \text{ of } 435.3 - (11/7) \% \text{ of } 1734.67 = ?$

a. 78

b. 69

c. 50

d. 59

e. 62

50. $13.689 \times 17.213 + 21.864 \times 8.79 = ?$

a. 400

b. 380

c. 440

d. 460

e. None of these

Answer with Solution

Solution (1-10)

1. B

$$62.5\% \text{ of } 800 - 33.33\% \text{ of } 960 = 125\% \text{ of } x$$

$$125\% \text{ of } x = \frac{800}{8} \times 5 - \frac{960}{3}$$

$$125\% \text{ of } x = 500 - 320$$

$$x = 180 \times \frac{100}{125}$$

$$x = 144$$

2. A

$$(2)^5 \times (32)^3 \div (64)^2 = (40 \div 10)^{?+1}$$

$$(2)^5 \times (2)^{15} \div (2)^{12} = (4)^{?+1}$$

$$(2)^8 = (2)^{2x+2}$$

Base is same

$$8 = 2x+2$$

$$x = 3$$

3. B

$$\sqrt{301 - \sqrt{168 - \sqrt{544 + \sqrt{1042 - \sqrt{324}}}}} = ? + 3$$

$$\sqrt{301 - \sqrt{168 - \sqrt{544 + \sqrt{1042 - 18}}} = ? + 3$$

$$\sqrt{301 - \sqrt{168 - \sqrt{544 + \sqrt{1024}}}} = ? + 3$$

$$\sqrt{301 - \sqrt{168 - \sqrt{544 + 32}}} = ? + 3$$

$$\sqrt{301 - \sqrt{168 - \sqrt{544 + 32}}} = ? + 3$$

$$\sqrt{301 - \sqrt{168 - \sqrt{576}}} = ? + 3$$

$$\sqrt{301 - \sqrt{168 - 24}} = ? + 3$$

$$\sqrt{301 - \sqrt{144}} = ? + 3$$

$$\sqrt{301 - 12} = ? + 3$$

$$\sqrt{289} = ? + 3$$

$$\text{or, } 17 = ? + 3 \text{ or, } ? = 14$$

4. B

$$48.3 \times 289 \div 3.4 \div 23 \div 68 \times 21 = ?^3 + 28.125$$

$$483 \times 289 \div 34 \div 23 \div 68 \times 21 = ? + 28.125$$

$$441 / 8 = ?^3 + 28.125$$

$$55.125 - 28.125 = ?^3$$

$$?^3 = 27$$

$$? = 3$$

5. E

$$? = (21^2 - 3^9) \times (729 - 729) + 121$$

$$? = 121 + 0 = 121$$

6. D

$$\Rightarrow \frac{(X-Y)^4 - 18}{7} \times \frac{9XY}{10Y^2 - 6XY} = ?$$

$$\Rightarrow \frac{81 - 18}{7} \times \frac{9 \times 10}{10 \times 7 - 6 \times 10}$$

$$\Rightarrow \frac{63}{7} \times \frac{9 \times 10}{10 \times 7 - 6 \times 10}$$

$$\Rightarrow 9 \times \frac{90}{10}$$

$$\Rightarrow 81$$

7. A

$$143^2 + 188^2 + 201^2 - 142^2 - 186^2 - 199^2$$

$$= (143^2 - 142^2) + (188^2 - 186^2) + (201^2 - 199^2)$$

Using $a^2 - b^2 = (a+b)(a-b)$, we have:

$$(143 + 142)(143 - 142) + (188 + 186)(188 - 186) + (201$$

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$$\begin{aligned} &+ 199)(201 - 199) \\ &= 285 \times 1 + 374 \times 2 + 400 \times 2 \\ &= 1833 \end{aligned}$$

8. B

$$\frac{6\sqrt{6} \times 2\sqrt{3} \times 4\sqrt{2}}{12} = ? + 123 - 59$$

$$? + 64 = \frac{6\sqrt{6} \times 2\sqrt{3} \times 4\sqrt{2}}{12}$$

$$? + 64 = \frac{6 \times 6 \times 2 \times 4}{12}$$

$$? + 64 = 24$$

$$? = 24 - 64$$

$$? = -40$$

9. C

$$88555/89 + 4925/985 - 3\sqrt{6859} + \sqrt{441} = ?$$

$$? = 995 + 5 - 19 + 21$$

$$? = 1002$$

10. C

$$36 \% \text{ of } 63621 + 63 * 89 - 532 * 95 + 4275/95 = ?$$

$$? = 22903.56 + 5607 - 50540 + 45$$

$$? = -21984.44$$

Solution (11-20)

11. D

$$3\sqrt{2197} * 594 - \sqrt{256} * 449 + 0.8 \% \text{ of } 590 = ?$$

$$? = 13 * 594 - 16 * 449 + 4.72$$

$$? = 7722 - 7184 + 4.72$$

$$? = 542.72$$

12. C

$$\sqrt{11025/15} * 1968 + 12632 - 1262 * 23 = ?$$

$$? = 105/15 * 1968 + 12632 - 1262 * 23$$

$$? = 13776 + 12632 - 29026$$

$$? = -2618$$

13. A

$$526 * 24 + 224 * 28 - 198 * 23 - 608 = ?$$

$$? = 12624 + 6272 - 4554 - 608$$

$$? = 13734$$

14. E

$$(56^2 - 25^2) * 1/31 + ? \% \text{ of } 100 = 150 + (562 * 1.62)$$

$$(56 - 25) (56 + 25) * 1/31 + (? / 100) * 100 = 150 + 910.44$$

$$81 + (?) = 1060.44$$

$$? = 1060.44 - 81$$

$$? = 979.44$$

15. A

$$(3380 * 46/52) + 384 - (1832 * 3/4) = ? + 3\sqrt{12167} * \sqrt{4761}$$

$$? + 23 * 69 = 65 * 46 + 384 - 458 * 3$$

$$? = 2990 + 384 - 1374 - 1587$$

$$? = 3374 - 2961$$

$$? = 413$$

16. C

$$1625 * 222 * 3.8 - 622256 = ? + 98 \% \text{ of } 56558$$

$$? = 360750 * 3.8 - 622256 - 55426.84$$

$$? = 748594 - 55426.84$$

$$? = 693167.16$$

17. E

$$9^6/27 * 2187/27^4 * 3^? = 9/729 * 243/6561$$

$$81 * 3^? = 1/2187$$

$$34 * 3^? = 1/37$$

$$4 + ? = -7$$

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$$? = -7 - 4$$

$$? = -11$$

18. A

$$\sqrt{6084} + \sqrt{2401} \times 8 - 144 + 658 = ?$$

$$\Rightarrow 78 + 49 \times 8 - 144 + 658 = ?$$

$$\Rightarrow 78 + 392 - 144 + 658 = ?$$

$$\Rightarrow 1128 - 144 = ?$$

$$\Rightarrow 984 = ?$$

19. C

$$1/[3 + (1/(3 + 1/(3 - 1/3)))]$$

$$= 1/[3 + 1/(3 + 1/(8/3))]$$

$$= 1/[3 + 1/(3 + 3/8)]$$

$$= 1/[3 + 1/(27/8)]$$

$$= 1/[3 + 8/27]$$

$$= 1/(89/27)$$

$$= 27/89$$

20. D

$$\sqrt{10 + \sqrt{27 + \sqrt{65 + \sqrt{256}}}}$$

$$\sqrt{10 + \sqrt{27 + \sqrt{65 + 16}}}$$

$$\sqrt{10 + \sqrt{27 + \sqrt{81}}}$$

$$\sqrt{10 + \sqrt{27 + 9}}$$

$$\sqrt{10 + \sqrt{36}}$$

$$\sqrt{10 + 6} = \sqrt{16} = 4$$

Solution (21-25)

21. B

$$? = \frac{86 \times 3375}{225}$$

$$= 1290$$

22. A

$$89\% \text{ of } 624 + 1220 - \sqrt{10404} - 1020 = ?$$

$$? = 555.36 + 1220 - 102 - 1020$$

$$? = 653.36$$

23. D

$$(3.5 \times 3.5 \times 3.5 - 1.5 \times 1.5 \times 1.5) / (3.5 \times 3.5 + 1.5 \times 1.5 + 3 \times 3.5/2) = ?$$

$$\Rightarrow ? = [(3.5)^3 - (1.5)^3] / [(3.5)^2 + (1.5)^2 + 5.25]$$

$$\Rightarrow ? = (3.5 - 1.5) \{ (3.5)^2 + (1.5)^2 + 5.25 \} / [(3.5)^2 + (1.5)^2 + 5.25]$$

$$= 2.0$$

24. B

$$25/3 \times 22/5 + ? = 222/5$$

$$\Rightarrow 550/15 + ? = 222/5$$

$$\Rightarrow ? = (222/5) - (550/15)$$

$$= (666 - 550)/15$$

$$? = 116/15$$

25. A

$$1/7 + [7/9 - (3/2 + 2/9) - 2/9] = ?$$

$$\Rightarrow ? = 1/7 + [7/9 - (3/2 + 2/9) - 2/9]$$

$$\Rightarrow ? = 1/7 + [7/9 - 31/18 - 2/9]$$

$$\Rightarrow ? = 1/7 + (14 - 31 - 4)/18$$

$$\Rightarrow ? = 1/7 - 21/18$$

$$\Rightarrow ? = 1/7 - 7/6$$

$$\Rightarrow ? = (6 - 49)/42$$

$$? = -43/42.$$

Solution (21-50)

26. D

$$11.986 + ? = (251.87 \times 8 \times 6.99) \div 25$$

$$\Rightarrow 12 + ? \approx (252 \times 8 \times 7) \div 25$$

$$\Rightarrow 12 + ? = (10.08 \times 8 \times 7)$$

$$\Rightarrow 12 + ? \approx 560$$

$$? = 560 - 12 = 548$$

27. C

$$1 \frac{1}{16.99} \text{ of } 50.988 + ?\% \text{ of } 5500 = 41.992^2 + 49.99$$

$$1 \frac{1}{17} \text{ of } 51 + ?\% \text{ of } 5500 \approx 42^2 + 50$$

$$18 \times \frac{51}{17} + ?\% \text{ of } 5500 \approx 1764 + 50$$

$$54 + ?\% \text{ of } 5500 = 1814$$

$$?\% \text{ of } 5500 = 1814 - 54 = 1760$$

$$? = 100 \times \frac{1760}{5500} = 32$$

28. C

$$\sqrt{7378} \approx 86; \sqrt{1330} \approx 36; \sqrt{660} \approx 26$$

$$\sqrt{7378} \times \sqrt{1330} \div \sqrt{660} = ?$$

$$\Rightarrow 86 \times 36 \div 26 = 120$$

29. C

$$7000 \div 70 \times 95 = ? \times 20$$

$$\approx 475$$

30. B

$$125\% \text{ of } 4875 + 88.005 \times 14.995 = ?$$

Taking approximate value of each term,

$$\Rightarrow ? = 125/100 \times 4875 + 88 \times 15$$

$$\Rightarrow ? = 6093.75 + 1320$$

$$\Rightarrow ? \approx 6094 + 1320 = 7414 \approx 7415$$

31. A

$$\sqrt{1000} + \frac{3.001}{4.987} \text{ of } 1891.992 = ?$$

$$\Rightarrow ? \approx 31 + \frac{3}{5} \times 1892 = 31 + 1135.2$$

$$\Rightarrow ? = 1166$$

32. A

$$(?)^2 + (6.99)^3 = (19.99)^2 + (7.98)^2$$

$$(?)^2 = (19.99)^2 + (7.98)^2 - (6.99)^3$$

$$(?)^2 \approx 400 + 64 - 343$$

$$(?)^2 \approx 121$$

$$? \approx 11$$

33. D

$$? = 84.789\% \text{ of } 479.983 - 26.01\% \text{ of } 349.98 - 3024.31 \div 35.998$$

$$? \approx 85\% \text{ of } 480 - 26\% \text{ of } 350 - 3024 \div 36$$

$$? = 408 - 91 - 84$$

$$? = 233 \approx 235$$

34. C

$$(5 * 7)\% \text{ of } (34 * 55) + 456.60 = 699.10 + ?$$

$$\Rightarrow [(34*55*5*7)/100] + 456.60 = 699.10 + ?$$

$$\Rightarrow 1111.1 = 699.1 + ?$$

$$\Rightarrow ? = 1111.1 - 699.1$$

$$? = 412 \approx 410$$

35. E

$$? \approx \frac{6400 \times 103}{100} - 6300 \times \frac{3}{700} + 12$$

$$\approx 6592 - 27 + 12 = 6557$$

36. C

$$29.8\% \text{ of } 260 + 60.01\% \text{ of } 510 - 103.57 = ?$$

$$30\% \text{ of } 260 + 60\% \text{ of } 510 - 104 \approx ?$$

$$\Rightarrow 30/100 \times 260 + 60/100 \times 510 - 104 = ?$$

$$\Rightarrow 78 + 306 - 104 = ?$$

$$\Rightarrow ? = 384 - 104 = 280.$$

37. C

$$\sqrt{120} \times \sqrt{530} + \sqrt{1680} + \sqrt{5330} = ?$$

$$\Rightarrow \sqrt{120} \approx \sqrt{121} = 11$$

$$\Rightarrow \sqrt{530} \approx \sqrt{529} = 23$$

$$\Rightarrow \sqrt{1680} \approx \sqrt{1681} = 41$$

$$\Rightarrow \sqrt{5330} \approx \sqrt{5329} = 73$$

Then,

$$11 \times 23 + 41 + 73 = 253 + 41 + 73 = 367$$

38. C

$$11.12\% \text{ of } 261 - 32.01 + 50.01\% \text{ of } 3200 = ? / 2.99$$

$$11.12\% \text{ of } 261 = 1/9 * 261 = 29$$

$$50.01\% \text{ of } 3200 = 1600$$

$$29 - 32 + 1600 = ?/3$$

$$? = 1597 * 3 = 4791$$

39. C

$$17.99^2 - 14.05^2 + (2343.75 + 81.55) \div ? = 229$$

$$\approx 18^2 - 14^2 + (2344 + 82) \div ? = 229$$

$$= 324 - 196 + 2426/? = 229$$

$$= 128 + 2426/? = 229$$

$$= 2426/? = 101$$

$$\Rightarrow ? = 2426/101 = 24(\text{approx})$$

40. D

$$? = \frac{36}{100} \times 545 + \frac{32}{100} \times 215 - \frac{47}{100} \times 1300$$

$$= 196.2 + 68.8 - 611$$

$$= -346$$

41. B

$$\sqrt{6560} * 4.007 + 119.99 * 1.998 - 50.001\% \text{ of } 479.908 = ?$$

$$81 * 4 + 120 * 2 - 240 = ?$$

$$324 = ?$$

42. A

$$?*5 + 444.99 * 5.99 + 899.906 + 9.999 = 4579.99$$

$$?*5 + 445 * 6 + 900 + 10 = 4580$$

$$?*5 = 1000$$

$$? = 200$$

43. A

$$699.989 \div 7.05 - 4.998 * 17.96 + 14.05 * 3.99 - 12.09 = ?$$

$$700 \div 7 - 5 * 18 + 14 * 4 - 12 = ?$$

$$100 - 90 + 56 - 12 = ?$$

$$54 = ?$$

44. A

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$$\begin{aligned} ? &= 6\sqrt{7} \times 12\sqrt{7} - 361 \\ &= 504 - 361 \\ &= 143 \end{aligned}$$

45. D

$$6 \text{ of } 300 + 3 \text{ of } 430 = x\% \text{ of } 750$$

$$(300 \times 6) + (3 \times 430) = (x/100) \times 750$$

$$1800 + 1290 = 15x/2$$

$$(3090 \times 2)/15 = x$$

$$X = 412.$$

46. C

$$26\% \text{ of } 350 - 32\% \text{ of } 600 = x - 158 - 272$$

$$(26/100) \times 350 - (32/100) \times 600 = x - 158 - 272$$

$$91 - 192 + 158 + 729 = x$$

$$X = 786$$

47. C

$$(18)^2 + 23\% \text{ of } 1300 - (5/12) \text{ of } 840 = x - (10)^3$$

$$324 + (23/100) \times 1300 - (5/12) \times 840 = x - 1000$$

$$324 + 299 - 350 + 1000 = x$$

$$X = 1273 = 1275$$

48. D

$$34.99 \times 3.04 + 80.03\% \text{ of } 40.06 - 12.977 \times 1.907 + ?$$

$$= 45.06 \times 3.009$$

$$35 \times 3 + 80/100 \times 40 - 13 \times 2 + ? = 45 \times 3$$

$$105 + 32 - 26 + ? = 135$$

$$? = 24$$

49. B

$$? = (67/3) \times (435/100) - (11/7) \times (1735/100) \approx (97-27)$$

$$= 70 \approx 69$$

50. C

$$? = 14 \times 17 + 22 \times 9 = 238 + 198 = 436 = 440$$

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1. A and B together can do a work in 12 days, B and C can do together in 6 days while C and A together can do in 10 days. In how many days C alone will complete the work?

- a. $12 \frac{4}{5}$ days
- b. $10 \frac{10}{11}$ days
- c. $14 \frac{5}{6}$ days
- d. $13 \frac{7}{8}$ days
- e. None of these

2. A and B undertake to complete a piece of work for Rs. 1800. A can do it in 10 days, B can do it in 15 days and with the help of C they complete the work in 5 days. Find the share of C?

- a. Rs. 360
- b. Rs. 300
- c. Rs. 390
- d. Rs. 430
- e. None of these

3. A can do a piece of work in 15 days, B can do it in 18 days. B started the work after 6 days B left and A joins 5 days after the work was started. The work has finished in?

- a. 12 days

b. 17 days

c. 15 days

d. 9 days

e. None of these

4. P can do a piece of work in 21 days. Q is 40 percent more efficient than P. Then in how many days the work gets completed when both are working simultaneously?

a. 10 days

b. $8 \frac{3}{4}$ days

c. $9 \frac{1}{2}$ days

d. 12 days

e. None of these

5. 20 men can complete a work in 12 days. 6 days after they started the work, 5 men left the job. How many days will it take to complete the remaining work?

a. 10 days

b. 7 days

c. 8 days

d. 6 days

e. None of these

6. A and B undertake to complete a piece of work for Rs. 3240. A can do it in 12 days, B can do it in 18 days and with the help of C they complete the work in 6 days. Find the share of C?

- a. Rs. 620
- b. Rs. 480
- c. Rs. 500
- d. Rs. 540
- e. None of these

7. 20 men can complete a piece of work in 25 days. They started the work and after 5 days, 5 more men joined them. In how many days will the work be completed?

- a. 21 days
- b. 19 days
- c. 16 days
- d. 24 days
- e. None of these

8. Q can do a piece of work in 14 days. Q is 50 percent more efficient than P. In how many days half the work is completed when both are working simultaneously?

- a. $5\frac{3}{7}$ days
- b. $3\frac{2}{3}$ days
- c. $4\frac{3}{4}$ days
- d. $4\frac{1}{5}$ days
- e. None of these

9. A and B together can complete a work in 20 days while A is 25% more efficient than B, then find in

how many days the work will be complete if they work on alternative days starting with A?

- a. 40 days
- b. 35 days
- c. 32 days
- d. 28 days
- e. None of these

10. 35 women earned 105000 by working 20 days. How many men must work for 15 days to receive 108000 provided the daily wages of a man is twice that of a woman?

- a. 18 men
- b. 20 men
- c. 16 men
- d. 24 men
- e. None of these

11. Ganga and Jothi can do a piece of work in 12 days and 20 days respectively. They started the work, after 3 days Santhosh joined them, who can complete the same work in 5 days. What is the total number of days in which they had completed the work?

- a. $5\frac{3}{4}$ days
- b. $7\frac{1}{2}$ days
- c. $4\frac{4}{5}$ days
- d. $6\frac{2}{3}$ days
- e. None of these

12. P alone can do a piece of work in x days. Q alone can do the same work in 3 days more than P. R alone can do the same work in 20 days. They all started

working together and completed the work in 5 days.

Find the value of 'x'?

- a. 16 days
- b. 8 days
- c. 10 days
- d. 12 days
- e. None of these

13.A, B and C alone can do a piece of work in 18 days, 30 days and 24 days respectively. They all started working together and after 5 days B left the work and C left the work 8 days before completion of the work. How long did the work last?

- a. 12 days
- b. 18 days
- c. 15 days
- d. 24 days
- e. None of these

14.P can complete three-fifth of the work in 6 days and Q can complete the one-fourth of the same work in 5 days. Then in how many days P and Q together complete the work?

- a. $8\frac{4}{5}$ days
- b. $5\frac{3}{4}$ days
- c. $6\frac{2}{3}$ days
- d. $9\frac{1}{2}$ days
- e. None of these

15.A can do a piece of work in 15 days, B can do it in 18 days. B started the work after 6 days B left and A

joins 5 days after the work was started. The work has finished in?

- a. 12 days
- b. 17 days
- c. 15 days
- d. 9 days
- e. None of these

16.A alone can do a piece of work in x days. B alone can do the same work in 5 days more than A. C alone can do the same work in 15 days. If all of them working together and completed the work in $7\frac{1}{7}$ days, then find the value of 'x'

- a. 20
- b. 25
- c. 30
- d. 10
- e. 12

17.Moni can do a piece of work in 18 days, Moni and Jack together can do in 9 days. If Jack does the work only for half a day daily then in how many days the work will be completed?

- a. 16 days
- b. 9 days
- c. 18 days
- d. 12 days
- e. 10 days

18.M & N do a certain work in 40 days and 24 days respectively. M started the work alone and then after

8 days N joined him till the completion of the work.

How long did the work last?

- a. 16days
- b. 18days
- c. 20 days
- d. 22 days
- e. None of these

19.Rishwi can finish a work in 6 days working 4 hours a day. Dhiviksha can complete the same work in 4 days working 5 hrs a day. If both Rishwi and Dhiviksha work together, working 4 hrs a day, in how many days can they finished the work?

- a. 30/11
- b. 11/120
- c. 11/30
- d. 30/13
- e. None of these

20.Kathir takes thrice as much time as Karthi and twice as much as Krish to finish a piece of work. Together they finish the work in 3 days. What is the time taken by Karthi to finish the work?

- a. 10 days
- b. 12 days
- c. 6 days
- d. 4 days
- e. None of these

21.‘X’ men can complete a piece of work in 40 days. If there were 8 men more, the work could be finished in 10 days less. The original number of men is:

- a. 45
- b. 65
- c. 23
- d. 24
- e. 20

22.Preethi can complete the work in 24 minutes and Shri can complete the work in 36 minutes. Kavitha can complete the work in $\frac{6}{5}$ th of efficient by both Preethi and Shri together. Find the total time taken by all together to complete the work.

- a. $7\frac{2}{7}$ min
- b. $6\frac{6}{11}$ min
- c. $5\frac{7}{11}$ min
- d. $9\frac{9}{11}$ min
- e. None of these

23. A, B and C can do a piece of work in 15 days, 18 days and 24 days respectively. All of them started the work together after 5 days B and C left the work. Then in how many days A alone can do the remaining work?

- a. $3\frac{12}{27}$ days
- b. $2\frac{17}{24}$ days
- c. $4\frac{7}{13}$ days
- d. $5\frac{5}{7}$ days
- e. None of these

24.18 men can finish a piece of work in 50 days. 15 men started working and in 40 days they finished a certain part of the work. If it is required to finish the

remaining work in 6 days, then how many men must be added to the existing workforce?

- a. 24
- b. 35
- c. 32
- d. 20
- e. None of these

25. A project manager hired 25 boys to complete a project in 10 days. 25 boys started working, after 8 days project manager notices only four-fifth of the work was completed, then how many extra boys required completing the remaining work on time?

- a. 2
- b. 4
- c. 1
- d. 0
- e. 6

26. A water tank normally takes 7 hours to be filled by a tap but because of the leak, it takes another 2 hours. In how many hours will the leak empty a full water tank?

- a. 20.5 hours
- b. 24.4 hours
- c. 30 hours
- d. 31.5 hours
- e. None of these

27. Two pipes X and Y can fill a tank in 6 hours and 9 hours respectively. If they are turned on alternately

for one hour each starting with X, then what is the time taken to fill the tank?

- a. 6.25 hours
- b. 5.66 hours
- c. 7 hours
- d. 8 hours
- e. None of these

28. Pipe A and B can fill a cistern in 10 hours and 15 hours respectively. When a third pipe C which works as an outlet pipe is also open then the cistern can be filled in 18 hours. The outlet pipe can empty a full cistern in:

- a. 12 hours
- b. 8 hours
- c. 9 hours
- d. 14 hours
- e. None of these

29. Three pipes A, B and C can fill a tank in 15 minutes, 20 minutes and 30 minutes respectively. The pipe C is closed 6 minutes before the tank is filled. In what time the tank will be full?

- a. 6 minutes
- b. 8 minutes
- c. 12 minutes
- d. 14 minutes
- e. None of these

30. A tank has three pipes. The first pipe can fill $\frac{1}{2}$ part of the tank in 1 hour and the second pipe can fill $\frac{1}{3}$ part in 1 hour. The third pipe is for making

the tank empty. When all the three pipes are open, $\frac{7}{12}$ th part of the tank is filled in 1 hours. How much time will the third pipe take to empty the completely filled tank?

- a. 3 hours
- b. 4 hours
- c. 5 hours
- d. 6 hours
- e. None of these

31. Two taps can separately fill a tank in 12 min and 15 min. The first tap was replaced with a tap of double the radius and the second tap was replaced with a tap of half the radius. Now in what time will the tank get filled?

- a. $2\frac{6}{7}$ min
- b. $2\frac{5}{7}$ min
- c. 2 min
- d. $1\frac{1}{7}$ min
- e. None of these

32. Pipe A can fill a tank in 36 minutes and pipe B can fill it in 45 minutes. If both the pipes are opened to fill an empty tank, in how many minutes will it be full?

- a. 15
- b. 18
- c. 20
- d. 25
- e. None of these

33. Tap A can fill the empty tank in 12 hours, but due to a leak in the bottom it is filled in 15 hours. If the tank is full and then tap A is closed then in how many hours the leak can empty it?

- a. 45 hours
- b. 48 hours
- c. 52 hours
- d. 60 hours
- e. None of these

34. Pipe A and Pipe B can fill a cistern in 10 hours and 15 hours respectively. When a third pipe C which works as an outlet pipe is also open then the cistern can be filled in 18 hours. The outlet pipe can empty a full cistern in:

- a. 12 hours
- b. 8 hours
- c. 9 hours
- d. 14 hours
- e. None of these

35. A cistern has a leak which would empty it in 6 hours. A tap is turned on which fills the cistern @ 10 liters per hour and when the tank is full then it is emptied in 15 hours (when tap and the leak are active.. What is the capacity of the cistern?

- a. 100 litres
- b. 150 litres
- c. 120 litres
- d. None of these
- e. Can't be determined

36. Tap A fills a tank in 10 hours and B can fill it in 15 hours. Both are opened simultaneously. Sometimes later tap B was closed, then it takes total 8 hours to fill up the whole tank. After how many hours B was closed?

- a. 2
- b. 3
- c. 4
- d. 5
- e. None of these

37. If one pipe A can fill a tank in 20 minutes, then 5 pipes, each of 20% efficiency of A, can fill the tank in:

- a. 80
- b. 100 min
- c. 20 min
- d. 25 min
- e. None of these

38. A cistern can be filled with water by pipe A in 5 hours and it can be emptied by a second pipe B in 4 hours. If both the pipes are opened when the cistern is full, the time in which it will be emptied is:

- a. 25
- b. 20
- c. 16
- d. 18
- e. 28

39. Two pipes can fill a tank in 20 and 24 minutes respectively and a waste pipe can empty 3 gallons per minute. All the three pipes working together can fill

the tank in 15 minutes. The capacity of the tank is (in gallons):

- a. 105
- b. 110
- c. 140
- d. 120
- e. 125

40. A leak in the bottom of a tank can empty the filled tank in 6 hours. An inlet pipe fills water in the tank at the rate of 4 litre per minute. When the tank is full, then inlet pipe is opened and due to leakage tank is emptied in 10 hours. Then what is the capacity of the tank?

- a. 3600 litre
- b. 3500 litre
- c. 4800 litre
- d. 3200 litre
- e. 2400 litre

41. Two pipes P and Q can fill a cistern in 12 and 15 minutes respectively. If both are opened together and at the end of 3 minutes, the P is closed, how much longer will the cistern take to fill?

- a. $11\frac{1}{4}$ minutes
- b. $8\frac{3}{4}$ minutes
- c. $13\frac{2}{3}$ minutes
- d. $8\frac{1}{2}$ minute
- e. 15 minutes

42. A cistern can be filled by a tap in 4 hours while it can be emptied by another tap in 9 hours. If both the

taps are opened simultaneously, then after how much time will the cistern get filled?

- a. 4.5 Hours
- b. 5 Hours
- c. 6.5 Hours
- d. 7.2 Hours
- e. None of these

43.A large tanker can be filled by two pipes A and B in 60 minutes and 40 minutes respectively. How many minutes will it take to fill the tanker from empty state if B is used for half the time and A and B fill it together for the other half ?

- a. 15 min
- b. 20 min
- c. 27.5 min
- d. 30 min
- e. None of these

44.A tap can fill a tank in 6 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken to fill the tank completely ?

- a. 3 hrs 15 min
- b. 3 hrs 45 min
- c. 4 hrs
- d. 4 hrs 15 mins
- e. None of these

45.Two inlet pipes can fill an empty tank in 15 and 18 hours and one outlet pipe can empty the tank in 20 hours. If all the pipes opened simultaneously, then how many hours required fill the full tank?

- a. 11 $\frac{8}{11}$ hours
- b. 12 $\frac{5}{7}$ hours
- c. 13 $\frac{11}{13}$ hours
- d. 9 $\frac{5}{9}$ hours
- e. None of these

46.Two pipes A and B alone can fill an empty tank in 20 min and 24 min respectively. Two pipes are opened simultaneously, after some time pipe B is closed. In how many minutes after pipe B is closed if the tank was filled in 15 minutes

- a. 5 min
- b. 6 min
- c. 4 min
- d. 4.5 min
- e. None of these

47.Two inlet pipes can fill an empty tank in 12 and 15 hours and one outlet pipe can empty the tank in 20 hours. In how many hours required filling the full tank if all the pipes opened simultaneously?

- a. 6
- b. 14
- c. 10
- d. 12
- e. 8

48.Three pipes can fill an empty tank in 4 hours. If there is leakage in the tank it takes 1 hour more, then find the no of hours required to empty the full tank by leakage pipe alone

- a. 12

b. 15

c. 24

d. 18

e. 20

49. A tank has a leak which can empty a full tank in 28 minutes. A tap is turned on which can fill 2.5 liters a minutes. The tank now becomes empty in 42 minutes. What is the capacity of the tank?

a. 210 liters

b. 342 liters

c. 250 liters

d. 389 liters

e. None of these

50. Pipes p, q and r releases three different solution H₂O, HCl and HI. And these three pipes fill the empty tank in 25 minutes, 30 minutes and 40 minutes respectively. If all the pipes are opened, what is the ratio of HI in that mixed solution in tank after 5 minutes?

a. 15/59

b. 5/21

c. 7/19

d. 6/21

e. None of these

Answer Key with Detailed Solution

1. B

$$(A + B.\text{'s one day work} = (1/12)$$

$$(B + C.\text{'s one day work} = (1/6)$$

$$(C + A.\text{'s one day work} = (1/10)$$

$$2(A + B + C.\text{'s one day work} = (1/12) + (1/6) + (1/10) =$$

$$21/60 = 7/20$$

$$(A + B + C.\text{'s one day work} = 7/40$$

$$C.\text{'s one day work} = (A + B + C. - (A + B.$$

$$=> (7/40) - (1/12)$$

$$=> (84 - 40)/(40 \times 12)$$

$$=> 44/(40 \times 12)$$

$$=> 11/120$$

$$C \text{ can complete a whole work in} = 120/11 = 10 \frac{10}{11} \text{ days}$$

2. B

$$1/10 + 1/15 + 1/C = 1/5$$

$$1/C = (1/5) - (1/10 + 1/15)$$

$$(1/C. = (1/5) - (1/6) = 1/30$$

C can do it in 30 days.

$$\text{Efficiency of A, B and C} = (1/10) : (1/15) : (1/30) = 3 : 2 : 1$$

$$6.\text{'s} = 1800$$

$$1.\text{'s} = 300$$

$$\text{The share of C} = \text{Rs. } 300$$

3. C

$$(x - 5)/15 + 6/18 = 1$$

$$(x - 5)/15 + (1/3) = 1$$

$$(x - 5 + 5)/15 = 1$$

X = 15 days

4. B

Efficiency ratio = $\Rightarrow Q : P = 140 : 100 = 7 : 5$

Days ratio = $\Rightarrow Q : P = 5 : 7$

P can do a piece of work in 21 days

7's = 21 \Rightarrow 1's = 3

So Q can complete the work in 15 days

$\Rightarrow 1/21 + 1/15$

$\Rightarrow 36/(21 \times 15) = 4/35$

P and Q together can complete the work in $35/4 = 8 \frac{3}{4}$ days

5. C

Total work = men * days

Total work = $20 \times 12 = 240$

6 days work = $20 \times 6 = 120$

Remaining work = $240 - 120 = 120$ work

Now, the total men = $20 - 5 = 15$ men

Remaining work can be completed in,

$\Rightarrow 120/15 = 8$ days

Remaining work gets completed in 8 days.

6. D

$1/12 + 1/18 + 1/C = 1/6$

$1/C = (1/6) - (1/12 + 1/18)$

$(1/C) = (1/6) - (5/36) = 1/36$

We get, C = 36 days

Now efficiency of A, B and C are in the ratio of = 1/12:

$1/18 : 1/36 = 3 : 2 : 1$

6's = 3240

1's = 540

The share of C = Rs. 540

7. A

Total work = $20 \times 25 = 500$ work

5 days work = $20 \times 5 = 100$ work

Remaining work = $500 - 100 = 400$

According to the question,

$\Rightarrow 400/25 = 16$ days

The total no of days = $16 + 5 = 21$ days

The work gets completed in 21 days

8. D

Efficiency ratio of Q: P = 150: 100 = 3: 2

Days ratio of Q: P = 2: 3

P can do a piece of work in 14 days

2's = 14 \Rightarrow 1's = 7

So P can complete the work in 21 days

$(1/14 + 1/21) \times x = \frac{1}{2}$

$[35/(14 \times 21)] \times x = 1/2$

X = $21/5 = 4 \frac{1}{5}$ days

9. A

Efficiency of A and B = 125: 100 = 5: 4

The ratio of time taken by A and B = 4: 5 (4x, 5x)

$(1/4x) + (1/5x) = 1/20$

$9x/(4x \times 5x) = 1/20$

X = 9

The time taken by A and B = 4x, 5x = 36 and 45 days

Total units = 180 (LCM of 36, 45)

A's one day work = 5 units

B's one day work = 4 units

Work done in 2 days = $5 + 4 = 9$ units

Work done in 40 days = $9 \times 20 = 180$ units

Work will be completed in 40 days.

10. D

1 women's 1 day wages = Total wages/(no of days*total women)

$$\Rightarrow 105000 / (35 \times 20) = 150$$

1 men's 1 day wages = 2*1 women's 1 day wages = $2 \times 150 = 300$

Total men = $108000 / (15 \times 300) = 24$ men

11. C

Ganga's one day work = $(1/12)$ days

Jothi's one day work = $(1/20)$ days

Santhosh's one day work = $(1/5)$ days

(Ganga + Jothi)'s one day work = $(1/12) + (1/20) = 2/15$

3 day work = $(2/15) \times 3 = (2/5)$

Remaining work is,

$$\Rightarrow 1 - (2/5) = 3/5$$

(Ganga + Jothi + Santhosh)'s one day work,

$$\Rightarrow (2/15) + (1/5) = 5/15 = 1/3 \text{ days}$$

Whole work can be completed by three of them in 3 days.

According to the question,

$$(3/5) \times 3 = 9/5 \text{ days} = 1 \frac{4}{5} \text{ days}$$

$$\text{Required days} = 3 \text{ days} + 1 \frac{4}{5} \text{ days} = 4 \frac{4}{5} \text{ days}$$

12. D

$$(1/x) + (1/(x+3)) + 1/20 = 1/5$$

$$(1/x) + (1/(x+3)) = 1/5 - 1/20$$

$$(2x + 3)/(x^2 + 3x) = 3/20$$

$$40x + 60 = 3x^2 + 9x$$

$$3x^2 - 31x - 60 = 0$$

$$3x^2 - 36x + 5x - 60 = 0$$

$$3x(x - 12) + 5(x - 12) = 0$$

$$(3x + 5)(x - 12) = 0$$

$$x = -5/3, 12 \text{ (Eliminate -ve value.)}$$

$$x = 12 \text{ days}$$

13. A

Let x be the total number of days to complete the work,

$$x/18 + 5/30 + (x - 8)/24 = 1$$

$$x/18 + 1/6 + (x - 8)/24 = 1$$

$$4x + 12 + 3x - 24 = 72$$

$$7x - 12 = 72$$

$$7x = 84$$

$$x = 12 \text{ days}$$

Total days to complete the work = 12 days

14. C

P can complete $3/5$ th of the work = 6 days

P can complete the whole work in = $6 \times (5/3) = 10$ days

Q can complete $1/4$ th of the work = 5 days

Q can complete the whole work in = $5 \times 4 = 20$ days

(P + Q)'s one day work = $(1/10) + (1/20) = 3/20$

P and Q together can complete the work = $20/3 \text{ days} = 6 \frac{2}{3} \text{ days}$

15. C

$$(x - 5)/15 + 6/18 = 1$$

$$(x - 5)/15 + (1/3) = 1$$

$$(x - 5 + 5)/15 = 1$$

$$X = 15 \text{ days}$$

16. B

Given,

$$(1/x) + (1/(x+5)) + 1/15 = 7/50$$

$$(1/x) + (1/(x+5)) = 7/50 - 1/15$$

$$(2x+5)/(x^2+5x) = 11/150$$

$$11x^2 - 245x - 750 = 0$$

Simplify the above equation, we get $x = -30/11$,
 $275/11 = 25$, (Eliminate -ve value.

$$X = 25 \text{ days}$$

17. D

$$\text{Moni's 1 day work} = 1/18$$

They can together complete in 9 days.

$$\text{Jack's 1 day work} = 1/9 - 1/18 = 1/18$$

If Jack works only for half a day daily, then his 1 day
work becomes $(1/2) * (1/18) = 1/36$

Therefore, 1 day work of both Moni and Jack,

$$= 1/18 + 1/36 = 3/36 = 1/12$$

Hence, the work will be completed in 12 days.

18. C

$$\text{Work done by M in 8 days} = 1/40 * 8$$

$$= 1/5$$

$$\text{Remaining work} = 1 - 1/5 = 4/5$$

$$(M+N)'s \text{ 1 day work} = 1/40 + 1/24$$

$$= (3+5)/120 = 8/120$$

$$= 1/15$$

Now $1/15$ work is done by M & N in 1 day.

So $4/5$ work will be done by X and Y is,

$$= 15 * 4/5$$

$$= 12 \text{ days}$$

$$\text{Hence total time taken} = 12 + 8 = 20 \text{ days}$$

19. A

Rishwi can complete the work in $(6*4) = 24$ hrs

Dhiviksha can complete the work in $(4*5) = 20$ hrs

$$\text{Rishwi's 1 hr work} = 1/24$$

$$\text{Dhiviksha's 1 hr work} = 1/20$$

$$(\text{Rishwi and Dhiviksha's 1 hr work}) = (1/24 + 1/20)$$

$$= (5+6)/120 = 11/120$$

So both Rishwi and Dhiviksha will finish the work in
 $(120/11)$ hrs

$$\text{Number of days of 4 hrs each} = 120/11 * 1/4$$

$$= 120/44$$

$$= 30/11 \text{ days}$$

20. C

Kathir takes thrice as much time as Karthi and twice as
much as Krish,

Kathir takes x days, Karthi takes $x/3$ days and Krish
takes $x/2$ days

Together they work then finished in 3 days

$$(1/x) + (3/x) + (2/x) = 1/3$$

$$6/x = 1/3$$

$$x = 18$$

$$\text{Karthi takes } 18/3 = 6 \text{ days}$$

So, Karthi takes 6 days to complete work.

21. D

Let the number of men is "a"

$$a * 40 = (a+8)30$$

$$40a = 30a + 240$$

$$10a = 240 \Rightarrow a = 24$$

22. B

Total work = 72

Preethi = 24 minutes = 3 work/min

Shri = 36 minutes = 2 work/min

Kavitha = 12 minutes = 6 work/min ($\leq (6/5) \times (3+2)$)

Total work done in one minute = 11 works

= $72 / 11 = 6 \frac{6}{11}$ min

23. B

(A + B + C.'s one day work = $(1/15) + (1/18) + (1/24)$)

= $\Rightarrow (59/360)$

(A + B + C.'s 5 day work = $(59/360) \times 5 = 59/72$)

Remaining work = $1 - (59/72) = 13/72$

Remaining work done by A alone in,

= $\Rightarrow (13/72) \times 15 = 65/24 = 2 \frac{17}{24}$ days

24. B

Total work = $18 \times 50 = 900$ units

Remaining work = $900 - (15 \times 40) = 300$ units

Let x men be added to finish the remaining work in 6 days

$(15 + x) \times 6 = 300$

$15 + x = 50$

$X = 50 - 15 = 35$

25. D

Given,

$(25 \times 8) / (4/5) = (25+x) \times 2 / (1/5)$

$50 = 50+x$

$X=0$

Therefore no extra boys required to complete the work

26. D

Sol. Required time = $\frac{1}{7} - \frac{1}{9}$
 $= \frac{9-7}{63} = \frac{2}{63}$
 $= 31.5$ hours

27. C

Sol.

X 6 9
 \ / 54
 Y 9 6

Required time = $2 \times \frac{45}{9+6} + \frac{9}{9}$
 $= 2 \times 3 + 1$
 $= 7$ days

28. C

Sol. Required time = $\frac{1}{\frac{1}{10} + \frac{1}{15} - \frac{1}{18}} = 9$ hours

29.B

Sol.

work done in last 6 minutes = $6 \times (\frac{1}{15} + \frac{1}{20}) = \frac{42}{60}$

remaining work = $1 - \frac{42}{60} = \frac{18}{60}$

per minute work of A, B and C together = $\frac{1}{15} + \frac{1}{20} + \frac{1}{30} = \frac{9}{60}$

Total no. of minutes = $\frac{18}{\frac{9}{60}} + 6 = 8$ minutes

30. B

Let the 3rd pipe can empty full tank in x hours

$\frac{1}{2} + \frac{1}{3} - \frac{1}{x} = \frac{7}{12}, x = 4$ hours

31. A

Replaced first tap can fill tank in $= \frac{1}{4} \times 12 = 3$ minutes

Replaced second tap can fill tank in $= 4 \times 15 = 60$ minutes

Both taps can fill it together in

$$= \frac{1}{\frac{1}{3} + \frac{1}{60}}$$

$$= 2\frac{6}{7} \text{ minutes}$$

32. C

Efficiency of A = 2.78%

Efficiency of B = 2.22%

\therefore Combined efficiency of A and B = 5% (2.78 + 2.22)

Thus, it will take total of $\frac{100}{5} = 20$ minutes

33. D

Efficiency of A = 8.33%

Effective efficiency = 6.67%, when there is leakage

\therefore Efficiency of leakage = 1.66% = (8.33 - 6.67)

It means due to leakage a full tank will be empty in $\frac{100}{1.66} = 60$ hours

34. C

38.B

LCM of 5 and 4 = 20 units

Unit work of pipe A = $\frac{20}{5} = 4$ units

Unit work of pipe B = $\frac{20}{4} = 5$ units

When both pipes are opened together, total unit work of A and B = $4 + (-5) = -1$ unit

So, time taken by both pipes = $\frac{20}{1} = 20$ hours

39.D

Work done by the waste pipe in 1 minute

$$= \frac{1}{15} - \left(\frac{1}{20} + \frac{1}{24} \right) = \left(\frac{1}{15} - \frac{11}{120} \right) = -\frac{1}{40}$$

Volume of $\frac{1}{40}$ part = 3 gallons.

Volume of whole = (3 × 40) gallons = 120 gallons.

40. A

Efficiency of A + B = 10 + 6.66 = 16.66%

Efficiency of A + B + C = 5.55%

\therefore Efficiency of C (outlet pipe) = 16.66 - 5.55 = 11.11%

It means outlet pipe C can empty in 9 hours.

35. A

Efficiency of only leakage = 16.66%

Effective efficiency of leakage = 6.66%

It means the capacity of filling pipe = 10%

Therefore, the inlet pipe can fill the tank in 10 hours hence the capacity of tank = 100%

36. B

Efficiency of tap A and B = 16.66% = (10 + 6.66)

$\therefore 16.66x + 10 \times (8 - x) = 100\%$

$$\Rightarrow x = 3$$

37. C

A can fill the tank in 20 minutes

5 pipes of 20% efficiency of A will be equivalent to pipe A

So, same time is required to fill the tank i.e. 20 minutes.

Sol. One hour's work of emptying pipe = 1/6

Let capacity of tank is C litre.,

\therefore Time taken by inlet pipe to fill the tank alone = $\frac{C}{4} \times \frac{1}{60} = C/240$ hours

ATQ,

$$\frac{1}{6} - \frac{240}{C} = \frac{1}{10}$$

$$\frac{240}{C} = \frac{1}{6} - \frac{1}{10}$$

C = 3600 litres

41. A

P can fill = 12 minutes

Q can fill = 15 minutes

LCM of (12, 15) = 60

Efficiency of P = $\frac{60}{12} = 5$

Efficiency of Q = $\frac{60}{15} = 4$

ATQ,

Let x be the required time

$$9 \times 3 + x \times 4 = 60$$

$$x = \frac{33}{4} = 8\frac{1}{4} \text{ minutes}$$

$$\text{Total time taken} = 3 + 8\frac{1}{4} = 11\frac{1}{4} \text{ minutes}$$

42. D

$$\begin{aligned} \text{Net part filled in 1 hour} &= \left[\frac{1}{4} - \frac{1}{9} \right] \\ &= \frac{5}{36} \end{aligned}$$

Therefore, the cistern will be filled in $\frac{36}{5}$ hours i.e. 7.2 hours

43. D

$$\begin{aligned} \text{Part filled by (A + B) in 1 minute} &= \left[\frac{1}{60} + \frac{1}{40} \right] \\ &= \frac{1}{24} \end{aligned}$$

$$\text{Suppose the tank is filled in } x \text{ minutes} = \frac{4}{8}$$

$$\text{Then, } \frac{x}{2} \times \frac{1}{15} = 30 \text{ min.}$$

44. B

Time taken by one tap to fill the half tank = 3 hours

$$\begin{aligned} \text{Part filled by the four taps in 1 hour} &= \left[4 \times \frac{1}{6} \right] \\ &= \frac{2}{3} \end{aligned}$$

$$\begin{aligned} \text{Remaining part} &= \left[1 - \frac{2}{3} \right] \\ &= \frac{1}{3} \end{aligned}$$

$$\text{Therefore } \frac{2}{3} : \frac{1}{2} :: 1 : x$$

$$\begin{aligned} &\left[\frac{1}{2} \times 1 \times \frac{3}{2} \right] \\ &= \frac{3}{4} \text{ hours i.e. 45 minutes.} \end{aligned}$$

So, total time taken = 3 hours 45 minute

45. C

If all the pipes are opened simultaneously, then in,

$$=> (1/15) + (1/18) - (1/20)$$

$$=> (12 + 10 - 9)/180$$

$$=> 13/180$$

$$\text{Required hours} = 180/13 = 13 \frac{11}{13} \text{ hours}$$

46. B

$$15/20 + x/24 = 1$$

$$18 + x = 24 \Rightarrow x = 6 \text{ minutes}$$

47. C

LCM of 12, 15 and 20 = 60 units

Required no of hours = $60/(5+4-3)=60/6=10$ hours

48. E

Required no of hours = $\frac{1}{4} - \frac{1}{5} = (5-4)/20 = 1/20$

49. A

$(1/x) - (1/28) = -(1/42)$

$(1/x) = (1/28) - (1/42)$

$(1/x) = 84$ min

Capacity of the tank = $84 * 2.5 = 210$ liters

50. A

Part filled by p , q and r in 5 minutes = $5 (1/25 + 1/30 + 1/40) = 59/120$

part filled by r alone = $5/40 = 1/8$

The ratio of HI in mixture = $1/8 * (120/59) = 15/59$

Ratio of HI in solution = $15/59$

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1. A, B and C together complete the work in $4\frac{32}{37}$ days while B alone can complete the work in 18 days and C alone can complete the same work in 15 days.

How many days A can take to complete the work alone?

- a. 14 days
- b. 13 days
- c. 12 days
- d. 15 days
- e. None of these

2. Manohar and Ragu can separately do a piece of work in 15 and 18 days respectively. They worked together for 6 days, after which Ragu was replaced by Ranjith. If the work was finished in next $1\frac{1}{3}$ days, then find the number of days in which Ranjith alone could do the work?

- a. $8\frac{3}{4}$ days
- b. $9\frac{5}{6}$ days
- c. $10\frac{2}{5}$ days
- d. $7\frac{1}{2}$ days
- e. None of these

3. A piece of work has to be completed in 60 days, a number of men are employed but it is found that only

half of the work is done in 40 days, then an additional 30 men were joined to complete the work on time. Initially how many men are there to work?

- a. 30 men
- b. 26 men
- c. 24 men
- d. 34 men
- e. None of these

4. The ratio of efficiency of Ajay and Sneha is 6: 5. The ratio of number of days taken by Prabha to Sneha is 3: 2. Ajay takes 3 days less than Sneha, when Ajay and Sneha complete the work individually. Prabha and Sneha started the work and left after 3 days. The number of days taken by Ajay to finish the remaining work is?

- a. 12 days
- b. $9\frac{3}{4}$ days
- c. $10\frac{5}{6}$ days
- d. $11\frac{2}{5}$ days
- e. None of these

5. Ragu and Rajesh can separately do a piece of work in 12 and 15 days respectively. They worked together for 5 days, after which Rajesh was replaced by Rohit.

If the work was finished in next 2 days, then the number of days in which Rohit alone could do the work?

- a. 20 days
- b. 24 days
- c. 32 days
- d. 28 days
- e. None of these

6. 7 women and 5 men can do a work in 8 days. 6 women and 9 men can do a same work in 6 days. How long will 6 women and 7 men can take to do the work?

- a. $7\frac{1}{14}$ days
- b. $5\frac{3}{7}$ days
- c. $4\frac{2}{5}$ days
- d. $6\frac{7}{9}$ days
- e. None of these

Direction (7-8): Answer these questions based on the information given below.

A and C together can do a piece of work in 24 days. B and C together can do the same work in 20 days. C can complete the same work in 60 days. After A has worked for 10 days, B for 10 days, time taken by C to complete the remaining job is x days.

7. Mani, Kalai and Shiva take $(x-5)$ days, $(x-10)$ days and $(x+5)$ days respectively to complete a job. The three work in a rotation to complete the job with only 1 person working on a day. Who should start the job so that the job is completed in the least possible time?

- a. 18 days
- b. $18\frac{2}{3}$ days
- c. $19\frac{2}{3}$ days
- d. 20 days
- e. None of these

8. Shivani and Vijay alone can do a piece of work in $(x+5)$ and $(x+25)$ days respectively. They started working alternatively starts with Vijay, how many days required completing the total work?

- a. $37\frac{3}{5}$
- b. $36\frac{2}{5}$
- c. $35\frac{1}{5}$
- d. $37\frac{2}{5}$
- e. $38\frac{2}{5}$

9. A, B and C alone complete a piece of work in 24, 12 and 36 days respectively. If two persons work on each day (BC, AC and AB) starts from BC and continue until the work was completed, then find the no of days taken to complete the whole work.

- a. 9 days
- b. $9\frac{3}{4}$ days
- c. $8\frac{2}{3}$ days
- d. $9\frac{1}{3}$ days
- e. 10 days

10. The ratio of efficiency of Arun is to Chitra is 5:3. The ratio of number of days taken by Chitra to Banu is 2:3. Arun takes 8 days less than Chitra, when Arun and Chitra complete the work individually. Banu and Chitra started the work and left after 2 days. The

number of days taken by Arun to finish the remaining work is?

- a. 4 days
- b. 5 days
- c. 6 days
- d. 10 days
- e. None of these

11. A piece of work has to be completed in 50 days, a number of men are employed but it is found that only half of the work is done in 30 days, then an additional 20 men were joined to complete the work on time. How many men initially put to work?

- a. 30
- b. 35
- c. 40
- d. 45
- e. None of these

12. Kiran can do a piece of work in 9 days and Kumar can do the same work in 18 days. They started the work. After 3 days Sanjay joined them, who can complete the same work in 3 days. What is the total number of days in which they had completed the work?

- a. 12
- b. 8
- c. 4
- d. 6
- e. None of these

13. Arun can do a piece of work in 10 days, Bala in 15 days. They work together for 5 days, the rest of the work is finished by Chitra in two more days. If they get Rs. 6000 as wages for the whole work, what are the daily wages of Arun, Bala and Chitra respectively (in Rs)?

- a. 2400, 1600, 2000
- b. 2000, 1800, 2200
- c. 1800, 2600, 1600
- d. 1500, 2500, 2000
- e. 2800, 1400, 1800

14. A alone can do a piece of work in 20 days. B alone can do the same work in 5 days less than C. A and C together can do the same work in 12 days. B started working, after 2 days A joins with him for 2 days only and then C joins with him for last day only. If the remaining work completed by D alone in 5 days, then find the number of days taken by D alone to complete whole work?

- a. 8 days
- b. $7\frac{1}{2}$ days
- c. $6\frac{3}{4}$ days
- d. $8\frac{3}{4}$ days
- e. None of these

15. Vinoth is 50% less efficient than Gokul and they together can complete the work in 10 days. If they working together can complete whole work in 5 days, then find the number of days taken by Prabha and Vinoth working alternatively begins with Prabha

- a. $12 \frac{2}{3}$
- b. $11 \frac{2}{3}$
- c. $13 \frac{2}{5}$
- d. $14 \frac{2}{3}$
- e. $14 \frac{1}{3}$

16. Manu and Sharan together can do a piece of work in $6 \frac{2}{3}$ days. Sharan and Moni together can do the same work in 12 days. Manu and Moni together can do the same work in $7 \frac{1}{2}$ days. If Manu, Sharan and Moni working together, then find the share of Manu, out of total share of Rs.5500

- a. Rs.3000
- b. Rs.1500
- c. Rs.2400
- d. Rs.1800
- e. Rs.2100

17. A, B and C together can do a piece of work in $5 \frac{1}{3}$ days. A and B together can do the same work in $6 \frac{6}{7}$ days and B takes 4 days more than A. A and B started working together and every 3rd day C alone working until the work was completed. How many days are required to complete the whole work?

- a. 6
- b. 8
- c. 9
- d. 12
- e. 15

18. Sharmi alone can do a piece of work in 12 days who is 50% and 200% more efficient Sheeba and

Akila respectively. Sheeba started working on first day, second day Sharmi joins with her and Akila joins with her on third day, how many days required to completing the whole work?

- a. $8 \frac{2}{3}$
- b. $7 \frac{1}{2}$
- c. $8 \frac{1}{3}$
- d. $7 \frac{1}{3}$
- e. $8 \frac{1}{2}$

19. A alone can do three-fourth of a work in 18 days. B alone can do five-eighth of the same work in 20 days. C alone can do half of the same work in 24 days. Minimum no of days required completing the whole if two persons form a group and no group work on consecutive days?

- a. $13 \frac{3}{4}$
- b. $12 \frac{2}{3}$
- c. $14 \frac{5}{7}$
- d. $15 \frac{3}{4}$
- e. $11 \frac{4}{5}$

20. A alone can do a piece of work with 50% of its efficiency in 30 days, which is two times of the no of days taken by C alone can complete the whole work and five times of the no of days taken by B and C together can complete the whole work. Then find the no of days required by A and B together working 75% of their efficiency

- a. 6
- b. 7

- c. 8
- d. 4
- e. 5

21.P alone can do a piece of work in 15 days. Q alone can do the same work in 10 days. P and R together can do the same work in $6\frac{2}{3}$ days. P and Q started working on first day and Q and R together working on second day. This process continues until the work was completed. How many days required to complete the whole work?

- a. $5\frac{4}{5}$
- b. $5\frac{8}{11}$
- c. $6\frac{4}{5}$
- d. $7\frac{5}{6}$
- e. $5\frac{3}{4}$

22.A and B together can do a piece of work in 8 days. B and C together can do the same work in $9\frac{3}{5}$ days. A and C together can do the same work in $6\frac{6}{7}$ days. If A and B started working together after every two days C joins with them for one day, then find the number of days required to complete the whole work

- a. $7\frac{3}{4}$
- b. $8\frac{4}{5}$
- c. $9\frac{1}{3}$
- d. $8\frac{1}{2}$
- e. $9\frac{1}{2}$

23.A and B together can complete a job in 16 days. Both B and C, working alone can finish the same job in 12 days, A and B commence work on the job, and

work for 4 days, where upon A leaves, B continues for 2 more days, and then he leaves too, C now starts working, and finishes the job. How many days will C require?

- a. 5 days
- b. 8 days
- c. 3 days
- d. 7 days
- e. None of these

24.A can do a piece of work in 120 days and B can do it in 150 days. They work together for 20 days. Then A leaves and B continues the work. 12 days after that, C joins the work and the work is completed in 48 more days. In how many days C can do it alone?

- a. 225
- b. 220
- c. 230
- d. 240
- e. None of these

25.A,B and C individually can do a certain piece of work in 35,42 and 24 days resp. They started working together but after 'x' days A and C left the job and the remaining work is completed by B with 25% more efficiency. If the whole work is completed in $114\frac{5}{5}$ days then find the value of x.

- a. 7
- b. 6
- c. 5
- d. 3

e. 4

26. Four plumbers had to repair 364 taps. At the end of 3 days working 7 hours per day they had repaired 168 taps. In order to speed up the work, 3 more plumbers were added who also worked 7 hours daily. If the efficiency of each of the plumbers is same, how many additional days would it take to complete the task?

- a. 2 days
- b. 3 days
- c. 4 days
- d. 1 1/2 day
- e. None of these

27. Pipe A can fill the tank in 4 hours, while pipe B can fill it in 6 hours working separately. Pipe C can empty whole the tank in 4 hours. He opened the pipe A and B simultaneously to fill the empty tank. He wanted to adjust his alarm so that he could open the pipe C when it was half-filled, but he mistakenly adjusted his alarm at a time when his tank would be 3/4th filled. What is the time difference between both the cases, to fill the tank fully:

- a. 48 min.
- b. 54 min.
- c. 30 min.
- d. None of these
- e. Can't be determined

28. A cistern can be filled by two taps A and B coming from the same main pipeline in 20 and 30 minutes

respectively. Both the taps are opened at the same time but due to partial closing of a valve in the main pipeline, tap A was supplying only 4/5th of its capacity and tap B, 5/6th of its capacity. After some time, the valve in the main pipeline was opened fully thereby enabling the two taps to supply at full capacity. It took another 5 minutes to fill the cistern completely. How long (approx) was it before the valve on the main pipeline opened?

- a. 7 min
- b. 9 min
- c. 11 min
- d. 13 min
- e. 5 min

29. A bath can be filled by the cold water pipe in 20 minutes and by the hot water pipe in 30 minutes. A person leaves the bathroom after turning on both pipes simultaneously and returns at the moment when the bath should be full. Finding, however, that the waste pipe has been open, he now closes it. In 6 minutes more the bath is full. In what time would the waste pipe empty it?

- a. 16 min
- b. 29 min
- c. 24 min
- d. 27 min
- e. None of these

30. (x-5) person can do a work in x days and (x+5) person can do 75 % of the same work in (x-11) days.

Then in how many days can $(x+10)$ person finish the work?

- a. 15 days
- b. 10 days
- c. 20 days
- d. 24 days
- e. None of these

31. P, Q and R can complete the whole work in 20 days. P starts the work and works for 'x' days while Q and R complete the remaining $\frac{2}{5}$ of the work in 14 days then find the value of x?

- a. 24 days
- b. 28 days
- c. 32 days
- d. 20 days
- e. None of these

32. A water tank can be filled by a tap in 30 minutes and another tap can fill it in 60 minutes. If both the taps are kept open for 5 minutes and then the first tap is closed, how long will it take for the tap to fill the remaining part of the tank?

- a. 20 minutes
- b. 25 minutes
- c. 30 minutes
- d. 45 minutes
- e. None of these

33. A booster pump can be used for filling as well as for emptying a tank. The capacity of the tank is 2400 m^3 . The emptying capacity of the tank is 10 m^3 per

minute higher than its filling capacity and the pump needs 8 minutes lesser to empty the tank than it needs to fill it. What is the filling capacity of the pump (in m^3 per minute)?

- a. 54
- b. 60
- c. 50
- d. 45
- e. 65

34. Three pipes A, B and C can fill together a tank in 6 hours. After working together for 2 hours, C is closed and A and B can fill the remaining part in 7 hours. The number of hours taken by C alone to fill the tank is:

- a. 20 hours
- b. 22 hours
- c. 24 hours
- d. 16 hours
- e. 18 hours

35. Three taps A, B and C can fill a tank in 12, 15 and 20 hours respectively. If A is open all the time and B and C are open for one hour each alternately, the tank will be full in:

- a. 6 hrs
- b. $6 \frac{2}{3}$ hrs
- c. 7 hrs
- d. $7 \frac{1}{2}$ hrs
- e. None of these

36. Two pipes A and B can fill a tank in 20 hours and 25 hours respectively, while a third pipe C can empty 70% of the tank in 21 hours. All three pipes are opened in the beginning. After 12 hours C is closed. Find the time in which the tank will be full?

- a. 13 $\frac{2}{3}$ hours
- b. 11 $\frac{7}{8}$ hours
- c. 16 $\frac{3}{4}$ hours
- d. 15 $\frac{5}{9}$ hours
- e. None of these

37. Two pipes A and B can fill a tank in 18 hours and 24 hours respectively, while a third pipe can empty 60% of the tank in 18 hours. All three pipes are opened in the beginning. After 12 hours c is closed. Find the time which the tank will be full?

- a. 14 $\frac{2}{5}$ hours
- b. 12 $\frac{3}{4}$ hours
- c. 11 $\frac{5}{6}$ hours
- d. 13 $\frac{2}{3}$ hours
- e. None of these

38. Pipe A and Pipe B can fill a tank in 10 hours and 15 hours respectively while Pipe C can empty the full tank in 18 hours. If pipe A is opened at 7 am, Pipe B opened at 8:30 am and Pipe C at 10 am, then after 10 am, how much more time will be taken by all three pipes together to fill the tank?

- a. 7 hour 18 min
- b. 8 hour 36 min
- c. 6 hour 42 min

- d. 5 hour 24 min
- e. None of these

39. B is $\frac{5}{4}$ times as efficient as A. If A can fill the $\frac{3}{5}$ of the tank in 15 min, what fraction of the capacity of the tank would remain incomplete if B can fill the tank independently for 10 min only?

- a. $\frac{2}{3}$
- b. $\frac{1}{3}$
- c. $\frac{1}{4}$
- d. $\frac{1}{2}$
- e. None of these

40. P alone can fill two-third of an empty tank in 28 hours and Q alone can fill three-fifth of the same tank in 21 hours. Pipe A can empty the full tank in 70 hours. Pipe P and Q opened simultaneously, after every 2 hours pipe A is opened for 1 hour then find the number of hours required to fill the whole tank

- a. 33 $\frac{1}{11}$
- b. 32 $\frac{1}{11}$
- c. 33 $\frac{1}{3}$
- d. 32 $\frac{1}{3}$
- e. 11 $\frac{1}{11}$

41. Pipe P is half efficient as pipe R and 50% more efficient than Q. Pipe Q and R opened for alternative hours starts with pipe Q then how many hours required to fill the tank completely if P and Q together can fill the tank in 12 hours?

- a. 12 $\frac{2}{3}$ hrs
- b. 11 $\frac{4}{5}$ hrs

- c. 15 $\frac{1}{3}$ hrs
- d. 12 $\frac{1}{3}$ hrs
- e. None of these

42.B is $\frac{4}{3}$ times as efficient as A. If A can fill the $\frac{5}{8}$ of the tank in 15 min, what fraction of the capacity of the tank would remain incomplete if B can fill the tank independently for 10 min only?

- a. $\frac{2}{3}$
- b. $\frac{3}{4}$
- c. $\frac{5}{8}$
- d. $\frac{4}{9}$
- e. $\frac{2}{3}$

43.Three taps A, B and C can fill a tank in 10, 15 and 18 hours respectively. If A is open all the time and B and C are open for one hour each alternately, the tank will be full in?

- a. 6 hrs
- b. 6 hr 48 min
- c. 7 hr 32 min
- d. 7 $\frac{1}{2}$ hrs
- e. None of these

44.A tank is fitted with 2 inlet pipes A and B. Both pipes are kept open for 15 minutes to fill $\frac{3}{5}$ of the tank and pipe A is closed. If pipe A is thrice as fast as pipe B. How much time will be taken by B alone to complete the remaining work?

- a. 45min
- b. 50 min
- c. 40min

- d. 30min
- e. None of these

45.Three pipes P1, P2 and P3 can fill a glass tub from empty to full in 30 minutes, 20 minutes, and 10 minutes respectively. When the glass tub is empty, all the three pipes are opened. P1,P2 and P3 discharge chemical solutions C, H and T respectively. What is the proportion of the solution T in the liquid in the pot after 3 minutes?

- a. $\frac{11}{6}$
- b. $\frac{5}{11}$
- c. $\frac{6}{11}$
- d. $\frac{1}{11}$
- e. None of these

46.Two water taps T1 and T2 can fill a tank in 900 seconds and 2400 seconds respectively. Both the taps are opened together but after 240 seconds, tap T1 is turned off. What is the total time required to fill the tank?

- a. 30 min 10 sec
- b. 25 min 20 sec
- c. 14 min 40 sec
- d. 20 min 10 sec
- e. None of these

47.A small hole in the bottom of a cistern can empty the full container in 360 minutes. An inlet pipe fills water at the rate of 4 liters a minute. When the container is full, the inlet is opened and due to the

leak, the cistern is empty in 24 hours. How many liters does the cistern hold?

- a. 1290 litre
- b. 2120 litre
- c. 1920 litre
- d. 2020 litre
- e. None of these

48. Three taps T1, T2 and T3 can fill a tank in 720, 900 and 1200 minutes respectively. If T1 is open all the time and T2 and T3 are open for one hour each alternately, the tank will be full in:

- a. $6\frac{2}{3}$ hours
- b. 9 hours
- c. 4 hours
- d. 7 hours
- e. None of these

49. A booster pump can be used for filling as well as for emptying a container. The capacity of the container is 2400. The emptying of the container is 10 per minute higher than its filling capacity and the pump needs 8 minutes lesser to empty the container than it needs to fill it. What is the filling capacity of the pump?

- a. $40\text{ m}^3 / \text{min}$
- b. $50\text{ m}^3 / \text{min}$
- c. $60\text{ m}^3 / \text{min}$
- d. $70\text{ m}^3 / \text{min}$
- e. None of these

50. How much time a tank would take to be filled by 3 pipes which diameters are 2 cm, 3 cm and 4 cm running together, when the largest pipe alone takes 58 minutes time to fill the tank. [Note: The amount of water flowing in each pipe is proportional to the square of its diameter.]

- a. 25 minutes.
- b. 30 minutes.
- c. 27 minutes.
- d. 32 minutes.
- e. 28 minutes.

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Answer with Detailed Solution

1. C

A, B and C together complete the work in = $4 \frac{32}{37}$ days
= $\frac{180}{37}$ days

(A + B + C)'s one day work = $\frac{37}{180}$

B's one day work = $\frac{1}{18}$

C's one day work = $\frac{1}{15}$

A's one day work = $(\frac{37}{180}) - (\frac{1}{18} + \frac{1}{15})$

= $\frac{37}{180} - \frac{11}{90} = \frac{15}{180} = \frac{1}{12}$

A can take to complete the work alone in 12 days

2. D

Manohar and Ragu's one day work = $(\frac{1}{15}) + (\frac{1}{18}) = \frac{11}{90}$

Manohar and Ragu's 6 day work = $(\frac{11}{90}) * 6 = \frac{11}{15}$

Remaining work $\frac{4}{15}$ done by Manohar and Ranjith

Manohar and Ranjith finished it in $1 \frac{1}{3}$ days

$(\frac{4}{15}) * (\text{Manohar} + \text{Ranjith})$'s whole work = $(\frac{4}{3})$

(Manohar + Ranjith)'s whole work = $(\frac{4}{3}) * (\frac{15}{4}) = 5$ days

Ranjith's one day work = $(\frac{1}{5}) - (\frac{1}{15}) = \frac{2}{15}$

Ranjith alone can complete the work in $7 \frac{1}{2}$ days

3. A

Let initially the no of men be x,

A piece of work has to be completed in 60 days

According to the question,

Men	days	work
-----	------	------

X	40	$(\frac{1}{2})$
---	----	-----------------

(x + 30)	20	$(\frac{1}{2})$
----------	----	-----------------

Work = men * days

= $> 40x / (\frac{1}{2}) = (x + 30) * 20 / (\frac{1}{2})$

= $> 40x = (x + 30) * 20$

= $> 40x = 20x + 600$

= $> 20x = 600$

= $> x = 30$ men

4. C

The ratio of efficiency of Ajay and Sneha = 6: 5

The ratio of number of days taken by Ajay and Sneha =
5: 6

The ratio of number of days taken by Prabha and Sneha
= 3: 2

Ratio of number of days taken by Ajay: Sneha: Prabha =
5: 6: 9

According to the question,

= $> \text{Sneha} - \text{Ajay} = 8$ days

= $> 6's - 5's = 3$

= $> 1's = 3$

Number of days taken to finish the whole work,

= $> \text{Ajay} = 15$ days, Sneha = 18 days, Prabha = 27 days

Work done by Prabha and Sneha in one day,

= $> (\frac{1}{18}) + (\frac{1}{27}) = \frac{45}{(18*27)} = \frac{5}{54}$

Prabha and Sneha's 3 day work

= $> (\frac{5}{54}) * 3 = \frac{5}{18}$

Rest of the work = $\frac{13}{18}$

The number of days taken by Ajay to finish the
remaining work is,

Number of days = $(\frac{13}{18}) * 15 = \frac{65}{6} = 10 \frac{5}{6}$ days

5. B

Ragu and Rajesh worked together

$$1/12 + 1/15 = (12 + 15)/(12*15) = 3/20$$

$$\text{Ragu and Rajesh's 5 days work} = (3/20)*5 = (3/4)$$

Remaining work $1/4$ done by Ragu and Rohit

Ragu and Rohit finished it in 2 days

$$(1/4)*(\text{Ragu} + \text{Rohit})\text{'s whole work} = 2$$

$$(\text{Ragu} + \text{Rohit})\text{'s whole work} = 8$$

$$\text{Rohit's one day work} = (1/8) - (1/12) = 1/24$$

Rohit alone can complete the work in 24 days

6. A

Total work = (men (or) women)*days

Work equal, so,

$$(7w + 5m)*8 = (6w + 9m)*6$$

$$56w + 40m = 36w + 54m$$

$$20w = 14m$$

$$10w = 7m$$

$$1w = (7/10)m \Rightarrow 1m = 10/7w$$

$$7w + 5m = 7w + (50/7)w = 99/7w$$

$$6w + 7m = 6w + 10w = 16w$$

Women days

$$(99/7) \quad 8$$

$$16 \quad ?$$

$$(99/7)*8 = 16x$$

$$X = 99/14 \text{ days} = 7 \frac{1}{14} \text{ days}$$

7. C

$$\begin{aligned} \text{A alone complete a work} &= 1/24 - 1/60 = (5-2)/120 = \\ &3/120 = 1/40 \end{aligned}$$

$$\text{B alone completes the work} = 1/20 - 1/60 = 4/120 = 1/30$$

$$\text{LCM of 40, 30 and 60} = 120$$

$$\text{Total work} = 120 \text{ units}$$

$$A = 3 \text{ units per day}$$

$$B = 4 \text{ units per day}$$

$$C = 2 \text{ units per day}$$

$$A\text{'s 10 days work} = 10*3 = 30 \text{ units}$$

$$B\text{'s 10 days work} = 10*4 = 40 \text{ units}$$

$$\text{Remaining} = 120 - (30+40) = 50 \text{ units}$$

$$\begin{aligned} \text{Remaining units completed by C alone} &= 50/2 = 25 \text{ days} \\ &= x \end{aligned}$$

From the above statement we get $x = 25$ days

$$\text{Mani's one day work} = 1/(25-5) = 1/20$$

$$\text{Kalai's one day work} = 1/(25-10) = 1/15$$

$$\text{Shiva's one day work} = 1/(25+5) = 1/30$$

$$\text{LCM of 20, 15 and 30} = 60$$

$$\text{Total work} = 60 \text{ units}$$

$$\text{Mani's per day output} = 3 \text{ units}$$

$$\text{Kalai's per day output} = 4 \text{ units}$$

$$\text{Shiva's per day output} = 2 \text{ units}$$

Kalai is most efficient so she is working in first day and Mani is second most efficient so he is working in second day and Shiva is least efficient so he is working in third day.

$$1 \text{ cycle (3 days)} = (4+3+2) = 9 \text{ units}$$

$$6\text{th cycle (18 days)} = 9*6 = 54 \text{ units}$$

$$\text{Remaining work} = 60-54 = 6 \text{ units}$$

$$19\text{th day Kalai completes 4 units}$$

$$20\text{th days Mani completes } (6-4=2)/3$$

Total no of days = $19 + 2/3 = 19 \frac{2}{3}$ days

8. A

From the above statement we get $x = 25$ days

Shivani's per day work = $1/(25+5) = 1/30$

Vijay's per day work = $1/(25+25) = 1/50$

LCM of 30 and 50 = 150

Total work = 150 units

Shivani's per day work = 5 units

Vijay's per day work = 3 units

1 cycle (2 days) = $3 + 5 = 8$ units

18th cycle (36 days) = $8 * 18 = 144$ units

Remaining = $150 - 144 = 6$ units

37th day = 3 units completed

38th day = $3/5$ units completed

Required no of days = $37 + 3/5 = 37 \frac{3}{5}$ days

9. B

LCM of 24, 12 and 36 = 72

A = 3 units

B = 6 units

C = 2 units

B+C = 8 units

A+C = 5 units

A+B = 9 units

1 cycle (3 days) = $8 + 5 + 9 = 22$ units

3rd cycle (9 days) = $22 * 3 = 66$ units

Remaining = $72 - 66 = 6$ units

Remaining completed by B and C = $6/8 = \frac{3}{4}$

Required no of days = $9 \frac{3}{4}$ days

10. D

The ratio of efficiency of Arun and Chitra = 5:3

The ratio of number of days taken by Arun and Chitra = 3 : 5

The ratio of number of days taken by Chitra and Banu = 2:3

Ratio of number of days taken by Arun : Chitra : Banu = 6:10:15

According to the question,

=> Chitra – Arun = 8 days

=> $10's - 6's = 8$

=> $4's = 8$

=> $1's = 2$

Number of days taken to finish the whole work,

=> Arun = 12 days, Chitra = 20 days, Banu = 30 days

Work done by Banu and Chitra in two days,

=> $(2/20) + (2/30) = (1/10) + (1/15) = 25/(10*15) = (1/6)$

Rest of the work = $5/6$

The number of days taken by Arun to finish the remaining work is,

Number of days = $(5/6) * 12 = 10$ days

11. C

Let the no of men be x,

A piece of work has to be completed in 50 days

According to the question,

Men	days	work
-----	------	------

X	30	(1/2)
---	----	-------

(x +20)	20	(1/2)
---------	----	-------

Work = men * days

$$\Rightarrow 30x/(1/2) = (x + 20)*20/(1/2)$$

$$\Rightarrow 30x = (x + 20)*20$$

$$\Rightarrow 30x = 20x + 400$$

$$\Rightarrow 10x = 400$$

$$\Rightarrow x = 40 \text{ men}$$

12. C

$$\text{Kiran's one day work} = (1/9) \text{ days}$$

$$\text{Kumar's one day work} = (1/18) \text{ days}$$

$$\text{Sanjay's one day work} = (1/3) \text{ days}$$

$$(\text{Kiran} + \text{Kumar})'s \text{ one day work} = (1/9) + (1/18) = 3/18$$

$$= 1/6 \text{ days}$$

$$3 \text{ day work} = (1/6)*3 = (1/2)$$

(1/2) of the work can be completed. Remaining is,

$$\Rightarrow 1 - (1/2) = 1/2$$

$$(\text{Kiran} + \text{Kumar} + \text{Sanjay})'s \text{ one day work},$$

$$\Rightarrow (1/6) + (1/3) = 3/6 = 1/2 \text{ days}$$

Whole work can be completed by three of them in 2 days.

According to the question,

$$(1/2)*2 = 1 \text{ day}$$

$$\text{Total days} = 3 \text{ days} + 1 \text{ day} = 4 \text{ days}$$

13. A

$$\text{Arun's 1 day work} = (1/10) \text{ days}$$

$$\text{Bala's 1 day work} = (1/15) \text{ days}$$

$$(\text{Arun} + \text{Bala})'s \text{ 1 day work} = (1/10 + 1/15) = 25/(10*15)$$

$$= 5/6$$

$$\text{Remaining work} = 1 - (5/6) = 1/6 \text{ work}$$

$$(1/6)* \text{Chitra's whole work} = 2$$

$$\text{Chitra's whole work} = 12 \text{ days}$$

$$\text{Chitra's 1 day work} = (1/12) \text{ days}$$

$$\text{Arun} : \text{Bala} : \text{Chitra} = (1/10) : (1/15) : (1/12) = 6 : 4 : 5$$

$$15's = 6000$$

$$1's = 400$$

The daily wages of Arun, Bala and Chitra is, Rs. 2400, Rs. 1600 and Rs. 2000 respectively.

14. B

$$\text{A's one day output} = 1/20$$

$$\text{B's one day output} = 1/25$$

$$\text{C's one day output} = 1/30$$

Given,

$$\Rightarrow 5/25 + 2/20 + 1/30 = (60+30+10)/300$$

$$\Rightarrow 100/300 = 1/3$$

$$\text{Remaining} = 1 - 1/3 = 2/3$$

$$(2/3)* \text{D's whole work} = 5$$

$$\text{D's whole work} = 15/2 \text{ days} = 7 \frac{1}{2} \text{ days}$$

15. D

$$\text{Efficiency ratio of Vinoth and Gokul} = 1:2$$

Given,

$$1/x + 1/2x = 1/10$$

Simplify the above equation we get $x=15$ days

$$\text{Prabha one day work} = 1/5 - 1/10 = 1/10$$

$$\text{Vinoth one day work} = 1/30$$

$$1 \text{ cycle (2 days)} = (1/10 + 1/30) = 4/30$$

$$7\text{th cycle (14 days)} = 28/30$$

$$\text{Remaining} = 1 - 28/30 = 2/30$$

$$\text{Remaining work completed by Prabha} = (2/30)/(1/10) = 2/3$$

$$\text{Required number of days} = 14 + 2/3 = 14 \frac{2}{3} \text{ days}$$

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16. A

Manu, Sharan and Moni together work = $\frac{1}{2}$
 $(\frac{3}{20} + \frac{1}{12} + \frac{2}{15})$

$$\Rightarrow \frac{1}{2} \times (\frac{11}{30}) = \frac{11}{60}$$

Manu's per day work = $\frac{1}{10}$

Sharan's per day work = $\frac{1}{20}$

Moni's per day work = $\frac{1}{30}$

Efficiency ratio of Manu, Sharan and Moni =
 $\frac{1}{10} : \frac{1}{20} : \frac{1}{30} = 6 : 3 : 2$

Share of Manu = $\frac{6}{11} \times 5500 = \text{Rs. } 3000$

17. C

A, B and C together can do a piece of work in $5 \frac{1}{3}$ days
 $(A+B+C)$'s one day work = $\frac{3}{16}$

A and B together can do the same work in $6 \frac{6}{7}$ days

$(A+B)$'s one day work = $\frac{7}{48}$

C's one day work = $(\frac{3}{16}) - (\frac{7}{48}) = \frac{1}{24}$

B takes 4 days more than A

$$\Rightarrow B = A + 4 \text{ (Let us assume } A = x, B = x+4)$$

$$(\frac{1}{x}) + (\frac{1}{(x+4)}) = \frac{7}{48}$$

$$7x^2 - 68x - 192 = 0$$

$$X = 12$$

A's per day work = $\frac{1}{12}$

B's per day work = $\frac{1}{16}$

C's per day work = $\frac{1}{24}$

1 cycle (3 days) = $2(\frac{1}{12} + \frac{1}{16}) + \frac{1}{24}$

$$= \frac{16}{48} = \frac{1}{3}$$

3rd cycle (9 days) = $\frac{3}{3}$

Required number of days 9 days

18. E

LCM of 12, 18 and 36 = 36

Sharmi's per day work = $\frac{1}{12} = 3$ units

Sheeba's per day work = $\frac{1}{18} = 2$ units

Akila's per day work = $\frac{1}{36} = 1$ unit

1st day = 2 units

2nd day = 5 units

3rd day = 6 units

At the end of 3rd day 13 units completed out of 36 units

Required no. of days = $8 \frac{1}{2}$

19. C

LCM of 24, 32 and 48 = 96 units

A+B = 7 units

B+C = 5 units

A+C = 6 units

Most efficient group is A+B and Second most efficient group is A+C

1 cycle (2 days) = $7+6=13$ units

7th cycle (14 days) = 91 units

Required no of days = $14 \frac{5}{7}$

20. C

A's one day work with 100% efficiency = $\frac{1}{15}$

C's one day work = $\frac{1}{15}$

B and C's one day work = $\frac{1}{6}$

B's one day work = $\frac{1}{6} - \frac{1}{15} = \frac{1}{10}$

Required no of days = $\frac{1}{20} + \frac{3}{40} = \frac{5}{40} = \frac{1}{8}$

21. B

R's one day work = $\frac{3}{20} - \frac{1}{15} = \frac{5}{60} = \frac{1}{12}$

P and Q's one day work = $\frac{1}{15} + \frac{1}{10} = \frac{5}{30} = \frac{10}{60}$

Q and R's one day work = $\frac{1}{10} + \frac{1}{12} = \frac{11}{60}$

1 cycle (2 days) = 21 units completed

2 cycles (4 days) = 42 units completed

Next cycle will be P and Q,

So, 52 units get completed.

Remaining work completed by Q and R = $\frac{8}{11}$

Required number of days = $5 \frac{8}{11}$ days

22. E

Given,

$$2(A+B+C)=1/8+7/48+5/48=18/48=3/8$$

$$A+B+C=3/16$$

$$A's \text{ one day work} = 3/16 - 5/48 = 4/48 = 1/12$$

$$B's \text{ one day work} = 3/16 - 7/48 = 2/48 = 1/24$$

$$C's \text{ one day work} = 3/16 - 1/8 = 1/16$$

$$1 \text{ cycle (3 days)} = 2/12 + 2/24 + 1/16 = 5/16$$

$$3 \text{ cycles (9 days)} = 15/16$$

$$\text{Remaining} = 1 - 15/16 = 1/16$$

$$\text{Remaining work completed by A and B} = (1/16) / (1/12 + 1/24) = 1/2$$

$$\text{Total number of days} = 9 + 1/2 = 9 \frac{1}{2} \text{ days}$$

23. D

$$(A + B)' \text{ 4 days work} = \frac{4}{16} = \frac{1}{4}$$

$$B's \text{ 2 days work} = \frac{2}{12} = \frac{1}{6}$$

$$\therefore \text{Remaining work} = 1 - \left(\frac{1}{4} + \frac{1}{6}\right)$$

$$= \frac{7}{12}$$

$$\therefore \frac{\frac{7}{12}}{\frac{1}{12}} = 7 \text{ days} = \text{days that C require}$$

24. E

$$A \text{ and } B \text{ per day work} = \frac{1}{120} + \frac{1}{150} = \frac{27}{1800}$$

$$A \text{ and } B \text{ work in 20 days} = \frac{20 \times 27}{1800}$$

$$B \text{ work in 12 days} = \frac{12}{150} = \frac{144}{1800}$$

$$\text{Remaining work} = 1 - \left(\frac{540}{1800} + \frac{144}{1800}\right) = \frac{1116}{1800}$$

$$B \text{ and } C, 1 \text{ day work} = \frac{1116}{1800 \times 48}$$

$$C \text{ per day work} = \frac{1116}{1800 \times 48} - \frac{1}{150} = \frac{540}{1800 \times 48} = \frac{1}{160}$$

So no. of days by C to complete the work = 160

25. C

Total work (LCM of 35, 42 and 24) = 840 units

Amount of work done by A, B and C = 24, 20 and 35 units

Amount of work done by A, B and C together in 'x' days = $(24+20+35)*x = 79x$ units

Amount of work done by B alone in one day after increased efficiency = $20*1.25 = 25$ units

Amount of work done by B alone in $\{(114/5) - x\}$ days with increased efficiency = $\{(114/5) - 5\} * 25$

$$= (570 - 25x) \text{ units}$$

$$79x + 570 - 25x = 840$$

$$\Rightarrow x = 5$$

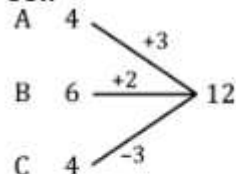
26. A

$$\text{Sol. } \frac{3 \times 7 \times 4}{168} = \frac{7 \times 7 \times x}{(364 - 168)}$$

$$x = 2 \text{ days}$$

27. B

Sol.



$$\begin{aligned} \therefore \text{Difference of their time} &= \frac{21}{5} - \frac{33}{10} \\ &= \frac{42-33}{10} \\ &= \frac{9}{10} \text{ hours} \\ &= 54 \text{ mins.} \end{aligned}$$

28. B

Let's assume the cistern's capacity = 60 litres

So, A supplies = $\frac{60}{20} = 3$ litre/min

B supplies = $\frac{60}{30} = 2$ litre/min

Now, due to closing of valve

A supplies = $3 \times \frac{4}{5} = \frac{12}{5}$ litre/min

B supplies = $2 \times \frac{4}{5} = \frac{8}{5}$ litre/min

In last 5 minutes cistern is filled at full capacity of pipes, and it is filled by = $5 \times (3 + 2) = 25$ litre

Remaining capacity = $60 - 25 = 35$

So required time = $\frac{35}{\frac{12}{5} + \frac{8}{5}} = 9$ min (approx)

29. C

Per minute fill by both pipes = $\frac{1}{20} + \frac{1}{30} = \frac{1}{12}$

In last 6 minutes, part of tank filled = $\frac{1}{12} \times 6 = \frac{1}{2}$

Filled in first 12 minutes = $1 - \frac{12}{x} = \frac{1}{2}$, $x = 24$

Thus waste pipe would empty it in 24 minutes.

30. B

$(x-5)$ person can do whole work in x days

$(x+5)$ person can do, $(75/100) \times \text{work in} = (x-11)$

Whole work in = $(x-11) \times (4/3)$

$(x-5) \times x = (x+5) \times (x-11) \times (4/3)$

$3x^2 - 15x = 4x^2 - 24x - 220$

$x^2 - 9x - 220 = 0$

$$(x+11)(x-20) = 0$$

$$x = -11, 20$$

So, $x = 20$ days

Person days

15 20

30 ?

$$(15 \times 20) = 30 \times y$$

$$Y = 300/30 = 10 \text{ days}$$

31. B

Time required by Q and R to complete the whole work

$$= 5 \times 14/2 = 35 \text{ days}$$

Time taken by P, Q and R = 20 days

Total units of work = 140 units

Q and R one day work = 4 units

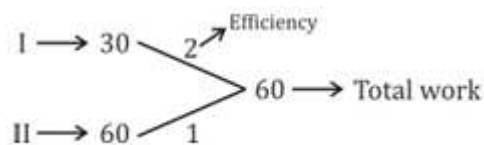
P, Q and R one day work = 7 units

P's one day work = $7 - 4 = 3$ units

Units of work done by P = $3 \times 140/5 = 84$ units

Required value of $x = 84/3 = 28$ days

32. D



Total efficiency = 3

For 5 min = $3 \times 5 = 15$ work

Remaining = $60 - 15 = 45$

$$\Rightarrow \text{Req. time} = \frac{45}{1} = 45 \text{ min}$$

33. C

Sol.

Let the filling capacity of the pump be $x \text{ m}^3$ per minute

Then, emptying capacity of the pump = $(x + 10) \text{ m}^3$ per minute

$$\text{So, } \frac{2400}{x} - \frac{2400}{(x + 10)} = 8$$

$$\Rightarrow x^2 + 10x - 3000 = 0$$

$$\Rightarrow (x - 50)(x + 60) = 0$$

$$\Rightarrow x = 50 \text{ m}^3 \text{ per minute}$$

34. C

A + B + C can fill a tank in 6 hours

They work for 2 hours together

So, $\frac{2}{6} = \frac{1}{3}$ work has done

Remaining work = $1 - \frac{1}{3} = \frac{2}{3}$

$\frac{2}{3}$ of work is done by A + B = 7 hours

A + B can fill the tank in = $7 \times \frac{3}{2} = \frac{21}{2}$

LCM of $(6, \frac{21}{2}) = 126$

Efficiency of A + B + C = $\frac{126}{6} = 21$

Efficiency of A + B = $\frac{126}{\frac{21}{2}} = 12$

So, efficiency of C = $21 - 12 = 9$

Time taken to fill the tank by C = $\frac{126}{9} = 14$ hours

35. C

$$(A + B)'s \text{ 1 hour work} = \left[\frac{1}{12} + \frac{1}{15} \right] = \frac{9}{60} = \frac{3}{20}$$

$$(A + C)'s \text{ 1 hour work} = \left[\frac{1}{12} + \frac{1}{20} \right] = \frac{8}{60} = \frac{2}{15}$$

$$\text{Part filled in 2 hours} = \left[\frac{3}{20} + \frac{2}{15} \right] = \frac{17}{60}$$

$$\text{Part filled in 6 hours} = \left[3 \times \frac{17}{60} \right] = \frac{17}{20}$$

$$\text{Remaining part} = \left[1 - \frac{17}{20} \right] = \frac{3}{20}$$

Now, it is the turn of A and B and $\frac{3}{20}$ part is filled by A and B in 1 hour.

So, total time taken to fill the tank = $(6 + 1) = 7$ hours

36. D

C can empty the tank in = $(21/70) \times 100 = 30$ hours

Total units of work = 300

A's one hour work = $300/20 = 15$ units

B's one hour work = $300/25 = 12$ units

C's capacity to empty in one hour = $300/30 = 10$ units

When three pipes are opened simultaneously then in one hour they will fill,

$(15 + 12 - 10) = 17$ units

In 12 hours they will fill = $17 \times 12 = 204$ units

After 12hrs, C will be closed

Time taken by A & B to fill the remaining tank = $96/27 = 3 \frac{15}{27} = 3 \frac{5}{9}$ hours

Total time will be = $12 + 3 \frac{5}{9} = 15 \frac{5}{9}$ hours

37. A

C can empty the tank in = $18/60 \times 100 = 30$ hours

Total units of work = 360

A's one hour work = $360/18 = 20$ units

B's one hour work = $360/24 = 15$ units

C's capacity to empty in one hour = $360/30 = 12$ units

When three pipes are opened simultaneously then in one hour they will

$(20 + 15 - 12) = 23$ units

In 12 hours they will fill = $23 \times 12 = 276$ units

After 12 hr, C will be closed

Time taken by A & B to fill the remaining tank = $84/35 = 2 \frac{2}{5}$ hours

Total time = $12 + 2 \frac{2}{5} = 14 \frac{2}{5}$ hours

38. D

Let capacity of tank = 90 lit (LCM of 10, 15, 18)

A fills $90/10 = 9$ liter/hour

B fills $90/15 = 6$ liter/hour

C empties $90/18 = 5$ liter/hour

Till 10 am $9*3 + 6*1.5 = 27 + 9 = 36$ liters

Remaining volume to be filled = $90 - 36 = 54$ liters

After 10 am, when all pipes are opened. $9 + 6 - 5 = 10$ liters/hr is filled.

Required time = $54/10 = 5 \frac{4}{10} = 5 \frac{2}{5}$ hour = 5 hour 24 min

39. D

B is $\frac{5}{4}$ times as efficient as A. So,

A and B's time $\Rightarrow 5 : 4$

A can fill the $\frac{3}{5}$ of the tank in 15 min

$\Rightarrow (\frac{3}{5}) * \text{work} = 15 \text{ min}$

\Rightarrow Whole work = 25 min

A takes 25 min to fill the tank, So, B takes,

$\Rightarrow 5's = 25$

$\Rightarrow 1's = 5$

B can fill the tank in, 20 min

B can fill the tank independently for 10 min only.

B's 10 min work = $10/20 = \frac{1}{2}$

Remaining = $1 - \frac{1}{2} = \frac{1}{2}$

Half of the tank will remain incomplete.

40. A

LCM of 42, 35 and 70 = 210

1 cycle (3 hours) = $2*(5+6) - 3 = 22-3=19$

11th cycle = 209 units completed

Remaining = $210-209=1$ units

Required no of hours = $33+1/11=33 \frac{1}{11}$

41. C

Efficiency ratio of P to Q = $150:100=3:2$

Time ratio of P to Q = $2:3$

Given,

$\frac{1}{2}x + \frac{1}{3}x = \frac{1}{12}$

$\frac{5}{6}x = \frac{1}{12}$

$X=10$ hrs

P=20, Q = 30 and R=10

LCM of 30 and 10 = 30 units

1 cycle (2 hrs) = $1+3=4$ units

7th cycle (14 hrs) = 28 units

15th cycle = $28+1=29$ units completed

Required number of hours = $15+1/3=15 \frac{1}{3}$ hrs

42. D

B is $\frac{4}{3}$ times as efficient as A. So,

A and B 's work $\Rightarrow 4:3$

A can fill the $\frac{5}{8}$ of the tank in 15 min

$\Rightarrow (\frac{5}{8}) * \text{work} = 15 \text{ min}$

\Rightarrow whole work = 24 min

A takes 24 min to fill the tank, So, B takes,

$\Rightarrow 4's = 24$

$\Rightarrow 1's = 6$

B can fill the tank in, 18 min

B can fill the tank independently for 10 min only.

B's 10 min work = $10/18 = 5/9$

Remaining = $1 - 5/9 = 4/9$

43. B

(A+B)'s 1 hour work = $1/10 + 1/15 = 1/6$

(A+C)'s 1 hour work = $1/15 + 1/18 = 11/90$

Part filled in 2 hour = $1/6 + 11/90 = 13/45$

Part filled in 6 hour = $(13/45) * 3 = 13/15$

Remaining = $1 - (13/15) = 2/15$

Now it is the turn for A+B, It can fill the $2/15$ part in,

$\Rightarrow (2/15) * 6 = 4/5 \text{ hr} = 4/5 * 60 = 48 \text{ min}$

The tank will be fill in 6 hour 48 min

44. C

Let B's 1 minute work = $1/x$; A's 1 minutes work = $3/x$

Total work by A and B in one minute = $1/x + 3/x = 4/x$

For 15 minutes = $4/x * 15 = 60/x$

$60/x = 3/5$

$X = 100$

B's 1 min work = $1/100$

$1/100$ part done in one minute

$2/5$ part = $100 * (2/5) = 40 \text{ min}$

45. C

Part of the glass tub filled by P1 in 1 minute = $1/30$

Part of the glass tub filled by P2 in 1 minute = $1/20$

Part of the glass tub filled by P3 in 1 minute = $1/10$

Here we have to find the proportion of the solution T.

Pipe P3 discharges chemical solution T

Part of the glass tub filled by P3 in 3 minutes = $3 * 1/10 = 3/10$

Part of the glass tub filled by pipe P1, P2 and P3 together in 1 minute = $1/30 + 1/20 + 1/10 = 11/60$

Part of the glass tub filled by pipe P1, P2 and P3 together in 3 minute = $3 * 11/60 = 11/20$

Required proportion = $(3/10)/(11/12) = 6/11$

46. B

900 sec = 15 min , 2400 sec = 40 min and 240 sec = 4 min

Part filled by tap T1 in 1 minute = $1/15$

Part filled by tap T2 in 1 minute = $1/40$

Part filled by tap T1 and tap T2 in 1 minute = $1/15 + 1/40 = 11/120$

Tap T1 and tap T2 were open for 4 minutes

Part filled by tap T1 and tap T2 in these 4 minutes = $4 * 11/120 = 11/30$

Remaining part to be filled = $1 - 11/30 = 19/30$

Time taken by tap T2 to fill this remaining part = $(19/30)/(1/40) = 76/3 = 25(1/3)$

i.e. 25 min 20 sec

47. C

360 min = 6 hr

Part emptied by the leak in 1 hour = $1/6$

Net part emptied by the leak and the inlet pipe in 1 hour = $1/24$

Part filled by the inlet pipe in 1 hour = $1/6 - 1/24 = 1/8$

i.e., inlet pipe fills the cistern in 8 hours = (8×60) minutes = 480 minutes

Given that the inlet pipe fills water at the rate of 4 liters a minute

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Hence, water filled in 480 minutes = $480 \times 4 = 1920$ litre
i.e. The cistern can hold 1920 litre

48. C

720 min = 12 hr, 900 min = 15 hr and 1200 min = 20 hr

Part filled by pipe T1 in 1 hour = $1/12$

Part filled by pipe T2 in 1 hour = $1/15$

Part filled by pipe T3 in 1 hour = $1/20$

In first hour, T1 and T2 is open

In second hour, T1 and T3 is open

then this pattern goes on till the tank fills

Part filled by pipe T1 and pipe T2 in 1 hour = $1/12 + 1/15$
= $3/20$

Part filled by pipe T1 and pipe T3 in 1 hour = $1/12 + 1/20$
= $2/15$

Part filled in 2 hour = $3/20 + 2/15 = 17/60$

Part filled in 6 hour = $17/60 \times 3 = 17/20$

Remaining part = $(1 - 17/20) = 3/20$

Now, 6 hours are over and only $3/20$ part needed to be filled.

At this 7th hour, T1 and T2 is open

Time taken by pipe T1 and T2 to fill this $3/20$ part =
 $(3/20)/(3/20) = 1$ hr

Total time taken = 6 hr + 1 hr = 7 hr

49. B

Let the filling capacity of the pump = $x \text{ m}^3/\text{min}$.

Then the emptying capacity of the pump = $(x + 10) \text{ m}^3/\text{min}$.

Time required for filling the container = $2400/x$ min.

Time required for emptying the container = $2400/(x+10)$ min.

Pump needs 8 minutes lesser to empty the container than it needs to fill it

$$2400/x - 2400/(x+10) = 8$$

$$+ 10x - 3000 = 0$$

$$x = 50 \text{ or } -60$$

i.e. filling capacity of the pump = $50 \text{ m}^3/\text{min}$.

50. D

Amount of water from three pipes is 4 units, 9 units and 16 units.

Let the capacity of cistern be 'p' units.

$$p/58 = 16$$

$$\Rightarrow p = 928 \text{ units.}$$

In 1 minute, quantity to be filled by 3 pipes = 29 units

Total time required = $928/29 = 32$ minutes.

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1. A can complete three-fifth of the work in 6 days and B can complete the two-seventh of the same work in 4 days. Then in how many days A and B together complete the work?

- a. $6\frac{3}{4}$ days
- b. $4\frac{7}{8}$ days
- c. $5\frac{5}{6}$ days
- d. $6\frac{1}{2}$ days
- e. None of these

2. If 4 men or 7 women can reap a field in 49 days, then what will be the time taken by 6 men and 14 women to reap the field?

- a. 12 days
- b. 10 days
- c. 16 days
- d. 14 days
- e. None of these

3. A and B undertook to complete a piece of work for Rs. 4500. A can do it in 12 days, B can do it in 16 days and with the help of C, they complete the work in $5\frac{1}{3}$ days. Find the share of C?

- a. Rs. 850
- b. Rs. 1000

c. Rs. 600

d. Rs. 700

e. None of these

4. 10 women and 6 men can do a work in 5 days. 7 women and 8 men can do a same work in 6 days. How long will 12 women and 3 men can take to do the work?

- a. $4\frac{3}{4}$ days
- b. $5\frac{1}{2}$ days
- c. $3\frac{5}{6}$ days
- d. $6\frac{1}{4}$ days
- e. None of these

5. 25 men can complete a piece of work in 16 days. After 4 days from the start of the work, some men left. If the remaining work was completed by the remaining men in 15 days, then find the men left after 4 days from the start of the work?

- a. 3 men
- b. 4 men
- c. 6 men
- d. 5 men
- e. None of these

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6. A and B can do a piece of work in 10 and 15 days respectively. They began the work together but A leaves after some days and B completed the remaining work in 8 days. Number of days after which A left the job?

- a. $2\frac{4}{5}$ days
- b. $4\frac{1}{2}$ days
- c. $3\frac{3}{4}$ days
- d. $5\frac{1}{3}$ days
- e. None of these

7. P, Q and R can complete the whole work in 20 days. P starts the work and works for 'x' days while Q and R complete the remaining $\frac{2}{5}$ of the work in 14 days then find the value of x?

- a. 24 days
- b. 28 days
- c. 32 days
- d. 20 days
- e. None of these

8. P takes 8 days to complete $\frac{2}{3}$ of a work, Q takes 3 days to complete $\frac{1}{7}$ of the same work and R takes 8 days to complete $\frac{4}{5}$ of the same work. If they work for 3 days together then Q and R leaves the work. Find the number of days P will take to complete the remaining work?

- a. $\frac{117}{28}$ days
- b. $\frac{95}{23}$ days
- c. $\frac{156}{25}$ days
- d. $\frac{129}{35}$ days

e. None of these

9. 20 men can complete a piece of work in 16 days. After 5 days from the start of the work, some men left. If the remaining work was completed by the remaining men $18\frac{1}{3}$ days, how many men left after 5 days from the start of the work?

- a. 10 men
- b. 9 men
- c. 8 men
- d. 6 men
- e. None of these

10. 6 men and 5 women can do a work in 10 days. 4 men and 7 women can do a same work in 12 days. How long will 6 women and 12 men can take to do the work?

- a. 8 days
- b. 10 days
- c. $5\frac{1}{2}$ days
- d. $6\frac{3}{4}$ days
- e. None of these

11. P can do a piece of work in 18 days. Q is 20 percent more efficient than P. Then in how many days three-fourth of the work is completed when both are working simultaneously?

- a. $7\frac{5}{13}$ days
- b. $9\frac{4}{7}$ days
- c. $6\frac{3}{22}$ days
- d. $8\frac{6}{17}$ days
- e. None of these

12. Ganesh and Ragu can separately do a piece of work in 25 and 20 days respectively. They worked together for 8 days, after which Ragu was replaced by Rohit. If the work was finished in next $3\frac{1}{2}$ days, then the number of days in which Rohit alone could do the work will be?

- a. 28 days
- b. 21 days
- c. 30 days
- d. 25 days
- e. None of these

13. 15 men can complete a work in 12 days. 4 days after they started the work, 3 men left and 8 more men joined. How many days will it take to complete the remaining work?

- a. 8 days
- b. 4 days
- c. 6 days
- d. 10 days
- e. None of these

14. 7 men and 9 women can complete a piece of work in 10 days while 5 men and 5 women can complete the same work in 15 days. Then find 10 men and 8 women to complete the same work in?

- a. $9\frac{11}{15}$ days
- b. $7\frac{17}{19}$ days
- c. $11\frac{3}{7}$ days
- d. $12\frac{5}{6}$ days
- e. None of these

15. Two men undertook to do a piece of work for Rs. 6000. One alone could do it in 15 days and the other can do it in 12 days, while with the assistance of a boy, work gets completed in 5 days. Find the share of boy?

- a. Rs. 1500
- b. Rs. 2750
- c. Rs. 2500
- d. Rs. 2000
- e. None of these

16. 9 women and 5 men can do a work in 9 days. 8 women and 9 men can do a same work in 6 days. How long will 5 women and 9 men can take to do the work?

- a. $6\frac{9}{19}$ days
- b. $7\frac{5}{11}$ days
- c. $8\frac{3}{7}$ days
- d. $5\frac{1}{5}$ days
- e. None of these

17. If 6 men or 9 women can reap a field in 69 days, then what will be the time taken by 10 men and 8 women to reap the field?

- a. 30 days
- b. 21 days
- c. 25 days
- d. 27 days
- e. None of these

18. Karthi is 40% more efficient than Rajesh, and Karthi can alone do a work in 20 days. If they

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working in alternative days starts with Karthi, then in how many days the work will get completed?

- a. 21 (1/7) days
- b. 26 (2/5) days
- c. 18 (6/17) days
- d. 23 (1/5) days
- e. 21 (3/5) days

19.5 men can complete a work in 12 days, 8 women can complete it in 18 days and 10 children can complete the same work in 24 days. In how many days can 10 men, 12 women and 8 children complete the same work?

- a. 3 9/17 days
- b. 4 2/9 days
- c. 5 3/7 days
- d. 6 6/11 days
- e. None of these

20.4 men or 6 women or 9 boys can finish a work in 98 days, and then the number of days taken by 6 men, 4 women and 5 boys to finish the work is?

- a. 28 days
- b. 32 days
- c. 24 days
- d. 36 days
- e. None of these

21.A and B alone can do a piece of work in x and (x+10) days respectively and they work together can finish the work in 9 3/8 days. Then find the efficiency ratio of A and B?

- a. 2:7
- b. 5:3
- c. 2:3
- d. 1:3
- e. 4:5

22.A, B and C all together can do a piece of work in 5 5/11 days. A takes 2 days less than the no of days taken by B and C together then find the no of days taken by A alone?

- a. 12
- b. 15
- c. 10
- d. 16
- e. 20

23.A, B and C gets a total wage of Rs.3600 if they work together. A and B gets a total wage of Rs. 2800 if they work together and A alone gets Rs.1600. Find the efficiency ratio of A, B and C.

- a. 1:2:3
- b. 2:4:3
- c. 4:3:2
- d. 2:5:4
- e. 1:5:3

24.Efficiency of A is 50% more than B and B takes 21 days to complete a piece of work. A started the work alone and then B joined with him in 5 days before actual completion of the work. For how many days A worked alone?

- a. 6 days
- b. 4 1/2 days
- c. 5 2/3 days
- d. 7 days

e. None of these

25. 20 men can do a piece of work in 24 days and 30 women can do the same work in 36 days. 12 men started working on first day and 24 women working on second day, then find the no. of days required to complete the whole work

a. $42 \frac{1}{3}$

b. $21 \frac{1}{3}$

c. $27 \frac{2}{3}$

d. $39 \frac{1}{3}$

e. $41 \frac{2}{3}$

26. A cistern can be filled separately by two pipes P and Q in 45 minutes and 35 minutes respectively. A tap R at the bottom can empty the full cistern in 30 minutes. If the tap R is opened 7 minutes after the two pipes P and Q are opened, then after what time from the opening of tap R the cistern becomes full?

a. 40th minute

b. 61st minute

c. 37th minute

d. None of these

e. Can't determine

27. Tap A fills a tank in 20 minutes while C empties it at $\frac{1}{3}$ rd the rate at which A fills it. At 12 : 00 noon, A and C are simultaneously started and when the tank is 50% full, tap A is turned off. At what time will the tank be empty?

a. 12 : 35 pm

b. 12 : 45 pm

c. 12 : 30 pm

d. 12 : 55 pm

e. None of these

28. A water tank has three taps A, B and C. A fills four buckets in 24 minutes, B fills 8 buckets in 1 hour and C fills 2 buckets in 20 minutes. If all the taps are opened together a full tank is emptied in 2 hours. If a bucket can hold 5 liters of water, what is the capacity of the tank?

a. 120 liters

b. 240 liters

c. 180 liters

d. 60 liters

e. None of these

29. Pipe A basically used as inlet pipe and pipe B is used as outlet pipe. Pipes A and B both are opened simultaneously, all the time. When pipe A fills the tank and B empty the tank, it will take double the time than when both the pipe fill the tank. When pipe B is used for filling the tank, its efficiency remains constant. What is the ratio of efficiency of pipe A and pipe B respectively?

a. 3 : 1

b. 5 : 2

c. 1 : 3

d. 3 : 2

e. None of these

30. Pipe A can fill an empty tank in 30 hours while B can fill it in 45 hours. Pipe A and B are opened and

closed alternatively i.e., first pipe A is opened, then B, again A and then B and so on for 1 hour each time without any time lapse. In how many hours the tank will be filled if it was empty, initially?

- a. 36
- b. 54
- c. 48
- d. 60
- e. None of these

31. Pipe A can fill an empty tank in 30 hours while B can fill it 45 hours. Pipe A and B are opened and closed alternatively i.e., first pipe A is opened, then B, again A and then B and so on for 1 hour each time without any time lapse. In how many hours the tank will be filled when it was empty, initially?

- a. 36
- b. 54
- c. 48
- d. 60
- e. None of these

32. One filling pipe A is 5 times faster than second filling pipe B. If B can fill a cistern in 36 minutes, the find the time when the cistern will be full if both fill pipes are opened together.

- a. 6 minutes
- b. 8 minutes
- c. 4 minutes
- d. 12 minutes
- e. None of these

33. Tap A can fill a tank in 20 hours, B in 25 hours but tap C can empty a full tank in 30 hours. Starting with A, followed by B and C each tap opens alternatively for one hour period till the tank gets filled up completely. In how many hour the tank will be filled up completely?

- a. $51 \frac{11}{15}$
- b. $52 \frac{2}{3}$
- c. $24 \frac{4}{11}$
- d. None of these
- e. Can't be determined

34. Two pipes A and B together can fill a cistern in 4 hours. Had they been opened separately, then B would have taken 6 hours more than A to fill the cistern. How many time will be taken by A to fill the cistern separately?

- a. 4 hours
- b. 2 hours
- c. 6 hours
- d. 8 hours
- e. 10 hours

35. There are two taps to fill a tank and a third to empty it. When the third tap is closed, they can fill the tank in 10min and 12min respectively. If all the three taps are opened, the tank is filled in 15min. If the first two taps are closed, in what time can the third tap empty the tank when it is full?

- a. $8 \frac{4}{7}$ mins
- b. $9 \frac{2}{5}$ mins

- c. 7 mins
- d. $6\frac{1}{7}$ mins
- e. 12 mins

36. One pipe can fill a tank three times as fast as another pipe. If together the two pipes can fill the tank in 36 minutes, then the slower pipe alone will be able to fill the tank in:

- a. 81 min
- b. 108 min
- c. 144 min
- d. 192 min
- e. 156 min

37. A tank can be filled by one tap in 20 min. and by another in 25 min. both the taps are kept open for 5 min. and then the second tap is turned off. In how many minutes more is the tank completely filled?

- a. 6 minutes
- b. 11 minutes
- c. 12 minutes
- d. 17 minutes
- e. 24 minutes

38. A cistern, when full, is emptied by a waste pipe in 30 minutes, but if a tap (filling source) is opened, it takes 40 minutes, to empty the cistern. How long the cistern will take to become full when only filling pipe is working?

- a. 140 minutes
- b. 120 minutes
- c. 160 minutes

- d. 180 minutes
- e. 150 minutes

39. One pipe can fill a tank three times as fast as another pipe. If together the two pipes can fill the tank in 86 minutes, then the slower pipe alone will be able to fill the tank in

- a. 81 min
- b. 108 min
- c. 144 min
- d. 192 min
- e. None of these

40. Three pipes A, B and C can fill a tank in 6 hours. After working at it together for 2 hours, C is closed and A and B can fill the remaining part in 7 hours. The number of hours taken by C alone to fill the tank is?

- a. 10
- b. 12
- c. 14
- d. 16
- e. None of these

41. Three pipes A, B and C can fill a tank in 10 hours. After working at it together for 3 hours, C is closed and A and B can fill the remaining part in 14 hours. How much time taken by C to fill the tank alone?

- a. 18 hours
- b. 20 hours
- c. 24 hours
- d. 22 hours

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e. None of these

42.P, Q and R can fill the tank in 12, 16 and 24 min respectively. All three began to fill the tank together but P and Q left 3 and 4 min respectively before filling the tank. Find the total time taken by all of them to fill the tank?

a. 12 min

b. 16 min

c. 8 min

d. 10 min

e. None of these

43.Two pipes A and B can fill a tank in 15 minutes and 25 minutes respectively. Both pipes are opened together and pipe B is closed, 5 minutes before the tank is filled completely. Calculate the total time required to fill the tank?

a. $11 \frac{1}{4}$ min

b. $13 \frac{3}{5}$ min

c. $12 \frac{7}{8}$ min

d. $14 \frac{5}{6}$ min

e. None of these

44.P, Q and R can fill the tank in 15, 18 and 20 min respectively. All three began to fill the tank together but P and Q left 4 and 5 min respectively before filling the tank. In how much time will take to fill the tank?

a. $7 \frac{22}{25}$ min

b. $8 \frac{30}{31}$ min

c. $7 \frac{11}{15}$ min

d. $8 \frac{4}{7}$ min

e. None of these

45.Pipe P can fill an empty tank in 24 hours and pipe Q can fill the same tank in 16 hours. How many hours required to fill the whole tank, if P and Q fill alternatively doing the work, P begins on first hour?

a. $17 \frac{1}{2}$

b. $19 \frac{1}{3}$

c. $18 \frac{1}{3}$

d. $18 \frac{3}{5}$

e. None of these

46.Pipe B is two times efficient as pipe C. Pipe A and B together can fill an empty tank in $8 \frac{4}{7}$ hours. Pipe A and C together can fill the same tank in 12 hours. In how many hours required filling by pipe B alone?

a. 15

b. 12

c. 20

d. 30

e. 10

47.Pipe A and B can fill an empty tank in 8 hours. Pipe B and C together can fill the same tank in $9 \frac{3}{5}$ hours. Pipe A opened for first one hour, Pipe B opened for second one hour and pipe C opened for third one hour and this process is repeated until the tank filled completely. How many hours required filling half of the tank if A is twice efficient as B?

a. 10 hrs

b. 12 hrs

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c. 6 hrs

d. 9 hrs

e. 8 hrs

48. Pipe A and Pipe B can fill a tank in 12 hours and 15 hours respectively while Pipe C can empty the full tank in 18 hours. If pipe A is opened at 7 am, Pipe B opened at 8:30 am and Pipe C at 10 am, then after 10 am, how much more time will be taken by all three pipes together to fill the tank?

a. 5 $\frac{12}{17}$ hour

b. 6 hour

c. 6 $\frac{15}{17}$ hour

d. 7 $\frac{12}{17}$ hour

e. None of these

49. A, B and C can fill the tank in 36, 48 and 42 min respectively. A and C could fill the tank in 6 min and then A and C stopped. Then B started to fill the tank, It fills the tank for some min and again A and C started 10 min before filling the tank. For how long B opened to fill the tank?

a. 7 $\frac{7}{20}$ min

b. 8 $\frac{8}{21}$ min

c. 8 $\frac{9}{20}$ min

d. 6 $\frac{6}{17}$ min

e. None of these

50. Three pipes A, B and C can fill a tank in 8 hours. After working at it together for 3 hours, C is closed and A and B can fill the remaining part in 6 hours. How much time taken by C to fill the tank alone?

a. 36 hours

b. 48 hours

c. 42 hours

d. 32 hours

e. None of these

Answer with Detailed Solution

1. C

A can complete $\frac{3}{5}$ th of the work = 6 days

A can complete the whole work in = $6 \times (\frac{5}{3}) = 10$ days

B can complete $\frac{2}{7}$ th of the work = 4 days

B can complete the whole work in = $4 \times (\frac{7}{2}) = 14$ days

(A + B)'s one day work = $(\frac{1}{10}) + (\frac{1}{14}) = \frac{24}{10 \times 14} = \frac{6}{35}$

A and B together can complete the work in, $\frac{35}{6} = 5 \frac{5}{6}$ days

2. D

$4m = 7w \rightarrow 1m = \frac{7}{4}w$

$7w \times 49 = (6m + 14w) \times x$

$7 \times 49 = 21 \frac{1}{2} \times x$ (converted to women)

$X = 14$

3. B

$\frac{1}{12} + \frac{1}{16} + \frac{1}{C} = \frac{3}{16}$

$\frac{1}{C} = (\frac{3}{16}) - (\frac{1}{12} + \frac{1}{16})$

$(\frac{1}{C}) = (\frac{3}{16}) - (\frac{7}{48}) = \frac{1}{24}$

C can do it in 24 days.

Efficiency of A, B and C = $(\frac{1}{12}) : (\frac{1}{16}) : (\frac{1}{24}) = 4 : 3 : 2$

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$$9's = 4500$$

$$1's = 500$$

The share of C = Rs. 1000

4. A

Total work = (men (or) women)*days

Work equal,

$$(10w + 6m)*5 = (7w + 8m)*6$$

$$50w + 30m = 42w + 48m$$

$$8w = 18m$$

$$4w = 9m \Rightarrow 1w = (9/4) m$$

$$10w + 6m = 10*(9/4) m + 6m = (57/2) m$$

$$12w + 3m = 12*(9/4) m + 3m = 30m$$

Women days

$$(57/2) \quad 5$$

$$30 \quad ?$$

$$(57/2)*5 = 30x$$

$$X = (57/2)*(5/30) = 4 \frac{9}{12} = 4 \frac{3}{4} \text{ days}$$

5. D

Total work = men*days

$$\text{Total units of work} = 25*16 = 400 \text{ units}$$

$$\text{Work done in 4 days} = 25*4 = 100 \text{ units}$$

$$\text{Remaining work} = 400 - 100 = 300 \text{ units}$$

Let the number of men left after 4 days be x,

According to the question,

$$300/15 = 25 - x$$

$$20 = 25 - x$$

$$X = 5 \text{ men}$$

After 4 days from the start of the work, 5 men left the job.

6. A

$$(1/10 + 1/15)*x + 8/15 = 1$$

$$(1/10 + 1/15)*x = 1 - (8/15)$$

$$(1/10 + 1/15)*x = 7/15$$

$$x/6 = 7/15$$

$$x = 14/5$$

$$X = 2 \frac{4}{5} \text{ days}$$

7. B

Time required by Q and R to complete the whole work

$$= 5*14/2 = 35 \text{ days}$$

Time taken by P, Q and R = 20 days

Total units of work = 140 units

Q and R one day work = 4 units

P, Q and R one day work = 7 units

P's one day work = $7 - 4 = 3$ units

Units of work done by P = $3*140/5 = 84$ units

Required value of x = $84/3 = 28$ days

8. D

Time taken by P = $8*3/2 = 12$ days

Q = $7*3 = 21$ days

R = $8*5/4 = 10$ days

Total units of work = 420 units

P's one day work = 35 units

Q's one day work = 20 units

R's one day work = 42 units

Work done in 3 days = $97*3 = 291$ units

Time required by P to complete the remaining work

$$= (420 - 291)/35 = 129/35 \text{ days}$$

9. C

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Total units of work = $20 \times 16 = 320$ units

Work done in 5 days = $20 \times 5 = 100$ units

Remaining work = $320 - 100 = 220$ units

Let the number of men left after 5 days be x

So,

$20 - x$ men completed the remaining 220 units in $55/3$ days

So,

$$(20 - x) \times 55/3 = 220$$

$$1100 - 55x = 660$$

$$55x = 440$$

$$x = 8 \text{ men}$$

10. C

Here work equal. So,

$$(6m + 5w) \times 10 = (4m + 7w) \times 12$$

$$60m + 50w = 48m + 84w$$

$$12m = 34w$$

$$6m = 17w$$

$$6m + 5w = 17w + 5w = 22w$$

$$12m + 6w = 34w + 6w = 40w$$

Women	days
-------	------

22	10
----	----

40	?
----	---

$$(22 \times 10) = (40 \times x)$$

$$x = (220/40) = 5 \frac{1}{2} \text{ days}$$

11. C

Efficiency ratio = $\Rightarrow Q : P = 6 : 5$

Days ratio = $\Rightarrow Q : P = 5 : 6$

P can do a piece of work in 18 days

$$6's = 18 \Rightarrow 1's = 3$$

So Q can complete the work in 15 days

$$(1/18 + 1/15) \times x = 3/4$$

$$[33/(18 \times 15)] \times x = 3/4$$

$$x = 135/22 \text{ days} = 6 \frac{3}{22} \text{ days}$$

12.D

$$\text{Ganesh and Ragu's one day work} = (1/25) + (1/20) = 45/(25 \times 20) = 9/100$$

$$\text{Ganesh and Ragu's 8 day work} = (9/100) \times 8 = 18/25$$

Remaining work $7/25$ done by Ganesh and Rohit

Ganesh and Rohit finished it in $3 \frac{1}{2}$ days

$$(7/25) \times (\text{Ganesh} + \text{Rohit})'s \text{ whole work} = (7/2)$$

$$(\text{Ganesh} + \text{Rohit})'s \text{ whole work} = 25/2$$

$$\text{Rohit's one day work} = (2/25) - (1/25) = 1/25$$

Rohit alone can complete the work in 25 days

13. C

Total work = men * days

$$\text{Total work} = 15 \times 12 = 180$$

$$4 \text{ days work} = 15 \times 4 = 60$$

$$\text{Remaining work} = 180 - 60 = 120 \text{ work}$$

$$\text{Now, the total men} = 15 - 3 + 8 = 20 \text{ men}$$

Remaining work can be completed in,

$$\Rightarrow 120/20 = 6 \text{ days}$$

Remaining work can complete it in 6 days.

14. B

Here work equal. So,

$$(7m + 9w) \times 10 = (5m + 5w) \times 15$$

$$70m + 90w = 75m + 75w$$

$$15w = 5m$$

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$$3w = 1m$$

$$7m + 9w = 21w + 9w = 30w$$

$$10m + 8w = 30w + 8w = 38w$$

Women days

$$30 \qquad 10$$

$$38 \qquad ?$$

$$(30 \times 10) = (38 \times x)$$

$$X = (300/38) = 7 \frac{17}{19} \text{ days}$$

15. A

$$(1/15) + (1/12) + 1 \text{ boy} = (1/5)$$

$$1 \text{ boy} = (1/5) - [(1/15) + (1/12)]$$

$$1 \text{ boy} = (1/5) - (3/20) = (4 - 3)/20 = 1/20$$

$$\text{The share of two men and a boy} = (1/15) : (1/12) : (1/20)$$

$$= > 4 : 5 : 3$$

$$12's = 6000$$

$$1's = 500$$

$$\text{The share of boy} = \text{Rs. } 1500$$

16. A

$$\text{Total work} = (\text{men (or) women}) \times \text{days}$$

Work equal,

$$(9w + 5m) \times 9 = (8w + 9m) \times 6$$

$$81w + 45m = 48w + 54m$$

$$33w = 9m$$

$$11w = 3m$$

$$m = 11/3$$

$$9w + 5m = 9w + (55/3)w = (82/3)w$$

$$5w + 9m = 5w + 33w = 38w$$

Women days

$$(82/3) \qquad 9$$

$$38 \qquad ?$$

$$(82/3) \times 9 = 38x$$

$$X = (41 \times 3)/19 = 123/19 = 6 \frac{9}{19} \text{ days}$$

17. D

$$6m = 9w \rightarrow 2m = 3w$$

$$9w \times 69 = 23w \times x (\text{converted to women})$$

$$X = 27$$

18. D

$$\text{The ratio of Efficiency of Karthi and Rajesh} = 140:100 = 7:5$$

$$\text{Then work ratio of Karthi and Rajesh} = 5:7$$

$$\text{Now given that, Karthi's one day's work} = 1/20$$

$$\text{Then Rajesh's one day's work} = 1/28$$

$$\text{Thus in two days, the work done by them} = 1/20 + 1/28 = 12/140$$

$$\text{Then work done by them in 22 days} = (12 \times 11)/140 = 132/140$$

$$\text{Work done by them in 23 days} = (132/140) + (1/20) = 139/140$$

$$\text{Remaining work} = 1 - (139/140) = 1/140$$

$$\text{Remaining work done by Rajesh in} = (1/140) \times 28 = (1/5) \text{ days}$$

$$\text{Thus total days to complete the work} = 23 + (1/5) = 23 \frac{1}{5} \text{ days}$$

19. A

$$1 \text{ man's } 1 \text{ day's work} = 1/60$$

$$1 \text{ woman's } 1 \text{ day's work} = 1/144$$

$$1 \text{ child's } 1 \text{ day's work} = 1/240$$

So,

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Required days = $(10/60 + 12/144 + 8/240)$

$$= 1/6 + 1/12 + 1/30$$

$$= 17/60$$

Required days = $60/17 = 3 \frac{9}{17}$ days

20. D

4 men = 9 boys \Rightarrow 1 man = $9/4$ boys

6 women = 9 boys \Rightarrow 1 woman = $3/2$ boys

6 men + 4 women + 5 boys = $(6 \times 9/4) + (4 \times 3/2) + 5 = 49/2$ boys

Boys	days
------	------

9	98
---	----

49/2	?
------	---

Now, $B1 \cdot D1 = B2 \cdot D2$

$$9 \cdot 98 = 49/2 \cdot D2$$

$$D2 = 36 \text{ days}$$

21. B

A = x days B = x+10 days

$$A+B = 1/x + 1/(x+10) = 1/(9 \frac{3}{8})$$

$$1/x + 1/(x+10) = 8/75$$

$$(x+x+10)/(x^2+10x) = 8/75$$

$$(2x+10) \cdot 75 = 8(x^2+10x)$$

$$75x+375 = 4x^2+40x$$

$$4x^2-35x-375=0$$

Simplify the above equation, we get $x = 60/4$, $-25/4 = 15$, $-25/4$ (Eliminate the -ve value)

X = 15 days

A = 15 and B = 25 days

Efficiency ratio of A and B = $1/15 : 1/25 = 5:3$

22. C

Let us take B and C together x days and A takes x-2

Given,

$$1/x + 1/(x-2) = 11/60$$

$$(x+x-2)/(x^2-2x) = 11/60$$

$$(2x-2)/(x^2-2x) = 11/60$$

$$11x^2-142x+120=0$$

Simplify the above equation, we get $x = 132/11$, $10/11 = 12$, $10/11$ (Eliminate $10/11$)

A takes to complete the work in $(12-2) = 10$ days

23. C

Total share of A, B and C = 3600

$$\text{Share of C} = 3600 - 2800 = 800$$

$$\text{Share of B} = 3600 - 800 - 1600 = 1200$$

Efficiency ratio of A, B and C = $1600 : 1200 : 800 = 16 : 12 : 8 = 4 : 3 : 2$

24. C

Efficiency (A : B) = $150 : 100 = 3 : 2$

Then days 2:3

B takes 21 days to do the work. Then A takes 14 days to do the work.

Total units of work = 42 (LCM of 14, 21)

A = 3 unit

B = 2 unit

A and B worked for 5 days $\Rightarrow 5 \cdot (3+2) = 25$ unit

Remaining = $(42-25) = 17$ unit

Then A did that 17 unit alone in $17/3 = 5 \frac{2}{3}$ days.

25. A

Man per day work = $1/(20 \cdot 24)$

Woman per day work = $1/(30 \cdot 36)$

1 cycle (2 day) = $12/(20 \times 24) + 24/(30 \times 36)$

21st cycle (42 days) = $357/360$

Remaining = $1 - 357/360 = 3/360$

Required no of days = $42 \frac{1}{3}$

26. C

Sol. After 7 min. part of the tank filled = $7 \times (\frac{1}{45} + \frac{1}{35})$

$$= \frac{16}{45}$$

Now Remaining part = $1 - \frac{16}{45}$

$$= \frac{29}{45}$$

Required time = $\frac{29/45}{\frac{1}{45} + \frac{1}{35}} = 36.9$

\therefore the tank will fill in 37^{th} minute

27. B

Sol. A \rightarrow 20 min

C \rightarrow 60 min

Time to fill 50% tank = $\frac{1}{2} \times \frac{1}{(\frac{1}{20} - \frac{1}{60})}$

$$= \frac{1}{2} \times \frac{60}{2}$$

$$= 15 \text{ min}$$

Time taken by tap c to empty

$$50\% \text{ tank} = \frac{1/2}{1/60}$$

$$= 30 \text{ min.}$$

\therefore Required time = 12 : 45 min.

28. B

Sol. Tap A fills 4 buckets ($4 \times 5 = 20$ litres) in 24 min.

In 1 hour tap A fills = $\frac{20}{24} \times 60 = 50$ litres

In 1 hour tap B fills = $8 \times 5 = 40$ litres

In 1 hour tap C fills = $\frac{2 \times 5}{20} \times 60 = 30$ litres

If they open together they would empty

$50 + 40 + 30 = 120$ litres in one hour

But full tank is emptied in 2 hours

So, tank capacity would be $120 \times 2 = 240$ litres.

29. A

Sol. $2 \left(\frac{1}{a} - \frac{1}{b} \right) = \left(\frac{1}{a} + \frac{1}{b} \right)$

$\therefore a : b = 1 : 3$ (Ratio of the time)

\therefore Ratio of their efficiency = 3 : 1

30.A

In 2 hr, tank will be filled by $3 + 2 = 5$ unit

$$\begin{array}{rcl} A = 30 & \xrightarrow{3} & 90 \\ B = 45 & \xrightarrow{2} & \end{array}$$

Total time taken = $\frac{90}{5} = 18$

$$18 \times 2 = 36 \text{ hr}$$

31. A

Sol.

$$\begin{array}{rcl} A & 30 & \xrightarrow{3} \\ B & 45 & \xrightarrow{2} \end{array} \quad 90$$

Required time = $\frac{90}{5} \times 2$

$$= \frac{180}{5}$$

$$= 36 \text{ hours.}$$

32. A

	A	B
Effi	5	1
Time	1	5

time taken by A to fill the tank = $\frac{36}{5}$ minutes

$$\begin{array}{rcl} 5 & \text{---} A & \text{---} \frac{36}{5} \\ 1 & \text{---} B & \text{---} 36 \end{array} \quad 36$$

Both pipe fill the tank together = $\frac{36}{6} = 6$ minute

33.A

$$\text{Portion filled in 3 hours} = \frac{1}{20} + \frac{1}{25} - \frac{1}{30} = \frac{17}{300}$$

$$\therefore \text{Portion filled in } 3 \times 17 \text{ hours} = \frac{17}{300} \times 17 = \frac{289}{300}$$

Remaining portion = $1 - \frac{289}{300} = \frac{11}{300}$ which will be filled by A in $\frac{11}{300} \times 20 = \frac{11}{15}$ hours

So, total time = $51 \frac{11}{15}$ hours

34. C

Let the cistern be filled by pipe A alone in x hours.

Then, pipe B will fill it in (x + 6) hours.

$$\therefore \frac{1}{x} + \frac{1}{(x+6)} = \frac{1}{4} \Rightarrow \frac{x+6+x}{x(x+6)} = \frac{1}{4}$$

$$\Rightarrow x^2 - 2x - 24 = 0 \Rightarrow (x - 6)(x + 4) = 0$$

$$\Rightarrow x = 6 \text{ hours.}$$

[Neglecting the -ve value of x]

35.A

Sol.

LCM of (10, 12, 15) = 60 unit

$$\text{So, unit work of both pipes} = \frac{60}{10}, \frac{60}{12} = 6, 5$$

$$\text{But unit work of all three together} = \frac{60}{15} = 4$$

$$\text{So, } 6 + 5 + x = 4 \Rightarrow x = -7$$

$$\therefore \text{Tank emptied in } \frac{60}{7} = 8\frac{4}{7} \text{ minutes}$$

36. C

Ratio of efficiency of both pipes

$$A : B = 3 : 1$$

So, time taken by both pipes = 1 : 3

$$x, 3x$$

$$\therefore \frac{1}{x} + \frac{1}{3x} = \frac{1}{36}$$

$$\Rightarrow \frac{3x}{4} = 36 \Rightarrow x = 48 \text{ minute}$$

$$\therefore \text{Slower pipe alone will be able to fill the tank in} = 48 \times 3 = 144 \text{ min}$$

37. B

39. C

Let the slower pipe alone fill the tank in x minutes. Then, faster pipes will fill it in

$$\frac{x}{3} \text{ minutes}$$

$$\text{Therefore, } \frac{1}{x} + \frac{3}{x} = \frac{1}{36}$$

$$\frac{4}{x} = \frac{1}{36}$$

$$x = 144 \text{ min.}$$

40. C

$$\text{LCM (20, 25)} = 100 \text{ unit}$$

$$A's \text{ efficiency} = \frac{100}{20} = 5 \text{ unit/min}$$

$$B's \text{ efficiency} = \frac{100}{25} = 4 \text{ unit/min}$$

$$5(A + B) + x.A = 100$$

$$5(5 + 4) + x.5 = 100$$

$$45 + 5x = 100$$

$$5x = 55 \Rightarrow x = 11 \text{ minute.}$$

38. B

Let waste pipe be A and filling pipe be B.

'A' alone can empty the cistern = 30 minutes

If B is also opened = - A + B can empty = 40 minutes

$$\text{LCM of (30, 40)} = 120$$

$$\text{Efficiency of A} = \frac{120}{30} = 4$$

$$\text{Efficiency of A - B} = \frac{120}{40} = 3$$

$$\text{So, efficiency of B} = 4 - 3 = 1$$

$$\text{So, B alone can fill the cistern} = \frac{120}{1} = 120 \text{ minutes}$$

$$\text{Part filled in 2 hours} = \frac{2}{6} = \frac{1}{3}$$

$$\text{Remaining part} = \left[1 - \frac{1}{3}\right] = \frac{2}{3}$$

$$\text{So, (A + B)'s 7 hours work} = \frac{2}{3}$$

$$\text{(A + B)'s 1 hour work} = \frac{2}{21}$$

$$\text{So, C's 1 hour work} = \left[\text{(A + B + C)'s 1 hour work} \right] - \text{(A + B)'s 1 hour's work} =$$

$$\left[\frac{1}{6} - \frac{2}{21} \right] = \frac{1}{14}$$

So, C alone can fill the tank in 14 hours.

41. B

Three pipes A, B and C can fill a tank in 8 hours.

A, B and C's 1 hour work = $1/10$

A, B and C's 3 hour work = $3/10$

Remaining work = $1 - (3/10) = 7/10$

The remaining part will be filled by A and B in 14 hours.

Then,

$$\Rightarrow (7/10) * (A+B) = 14$$

$$\Rightarrow (A+B)'s \text{ whole work} = 14 * (10/7) = 20 \text{ hr}$$

(A+B)'s 1 hour work = $1/20$

A, B and C's 1 hour work = $1/10$

C's 1 hour work = $(A+B+C) - (A+B)$

$$\Rightarrow (1/10) - (1/20)$$

$$\Rightarrow 1/20$$

C can fill the tank in 20 hours.

42. C

$$(x-3)/12 + (x-4)/16 + x/24 = 1$$

$$(4x - 12 + 3x - 12 + 2x)/48 = 1$$

$$9x - 24 = 48$$

$$9x = 72$$

$$X = 8 \text{ min}$$

43. A

Let total capacity = 75 litres (LCM of 15 and 25)

A = 5 litres/min

B = 3 litres/min

A+B fill 75 litres

A can fill $5 * 5 = 25$ litres in 5 min

But B was closed 5 min before the tank is filled. So A+B together filled $(75-25) = 50$ litres

50 litres can be filled by A + B in,

$$\Rightarrow (50/8) = 6 \frac{1}{4}$$

Total time = $6 \frac{1}{4} + 5 = 11 \frac{1}{4}$ min

44. B

$$(x - 4)/15 + (x - 5)/18 + x/20 = 1$$

$$(12x - 48 + 10x - 50 + 9x)/180 = 1$$

$$31x - 98 = 180$$

$$31x = 278$$

$$X = 278/31 = 8 \frac{30}{31} \text{ min}$$

45. B

LCM of 24 and 16 = 48 units

1 cycle (2 hours) = 5 units

9th cycle (18 hours) = 45 units

19th hour = 2 units

Required no of hours = $18 + 1 + 1/3 = 19 \frac{1}{3}$ hours

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46. A

Efficiency ratio of B and C = 2:1

Time ratio of B and C = 1:2

Given,

$$(1/A + 1/B) - (1/A + 1/C) = 7/60 - 1/12$$

$$1/B - 1/C = 2/60 = 1/30$$

$$1/x - 1/2x = 1/30$$

$$\Rightarrow 1/2x = 1/30$$

$$1/x = 1/15$$

47. E

Efficiency ratio of A and B = 2:1 and time ratio of A and B = 1:2

$$1/x + 1/2x = 1/8$$

$$3/2x = 1/8 \Rightarrow x = 12 \text{ hours}$$

A = 12 hrs B = 24 hrs C = 16 hrs

LCM of 12, 24 and 16 = 48 units

1st cycle (3 hrs) = 4+2+3=9 units

Half of the tank 24 units filled in 8 hrs

48. C

Let capacity of tank = 180 lit (LCM of 12, 15, 18)

A fills $180/12 = 15$ liter/hour

B fills $180/15 = 12$ liter/hour

C empties $180/8 = 10$ liter/hour

Till 10 am $15 \times 3 + 12 \times 1.5 = 45 + 18 = 63$ liters

Remaining volume to be filled = $180 - 63 = 117$ liters

After 10 am, when all pipes are opened. $15 + 12 - 10 = 17$ liters/hr is filled.

Required time = $117/17 = 6 \frac{15}{17}$ hour

49. B

A and C together can fill the tank in 1 min = $(1/36) + (1/42)$

A and C together can fill the tank in 6 min = $13/42$

A and C together can fill the tank in 10 min = $65/126$

Part filled in 16 min is, $(13/42 + 65/126) = 52/63$

Remaining = $1 - 52/63 = 11/63$

Remaining filled by B in, $(11/63) \times 48 = 176/21$ min

$\Rightarrow 8 \frac{8}{21}$ min

50. B

Three pipes A, B and C can fill a tank in 8 hours.

A, B and C's 1 hour work = $1/8$

A, B and C's 3 hour work = $3/8$

Remaining work = $1 - 3/8 = 5/8$

The remaining part will be filled by A and B in 6 hours.

Then,

$$(5/8) \times (A+B) = 6$$

$(A+B)$'s whole work = $48/5$ hr

$(A+B)$'s 1 hour work = $5/48$

A, B and C's 1 hour work = $1/8$

C's 1 hour work = $(A+B+C) - (A+B)$

$$(1/8) - (5/48)$$

$$1/48$$

C can fill the tank in 48 hours.