PROBABILITY

(A) PROBABILITY (ANSWERS) (11)

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1. (a) $n(S) = {}^{10}C_3 = \left(\frac{10 \times 9 \times 8}{3 \times 2}\right) = 120$

Now, $n(E) = \left({}^{4}C_1 \times {}^{6}C_2\right) = \left(4 \times \frac{6 \times 5}{2}\right) = 60$

$\therefore P(E) = \frac{n(E)}{n(S)} = \left(\frac{60}{120}\right) = \boxed{\frac{1}{2}}$

2. (c) $n(S) = {}^{29}C_1 = 29$

$n(E) = {}^{10}C_1 + {}^{7}C_1 = (10+7) = 17$

Now, $P(E) = \frac{n(E)}{n(S)} = \boxed{\frac{17}{29}}$

3. (b) $n(S) = 6^2 = 36$

$n(E) = \{(4,1); (4,2); (4,3); (4,4); (4,5); (4,6)$
$(1,4); (2,4) (3,4) (5,4); (6,4)\}$

$= 11$

$\therefore P(E) = \frac{n(E)}{n(S)} = \boxed{\frac{11}{36}}$

1. (c) $n(S) = {}^{7}C_2 = \left(\frac{7 \times 6}{2}\right) = 21$

$n(E) = \left\{\left({}^{2}C_1 \times {}^{5}C_1\right) + {}^{2}C_2\right\} = \{(2 \times 5) + 1\} = 11$

$\therefore P(E) = \frac{n(E)}{n(S)} = \boxed{\frac{11}{21}}$

5. (b) $n(S) = {}^{16}C_7 = 11440$

$n(E) = {}^{11}C_4 \times {}^{5}C_3 = 3300$

$P(E) = \frac{n(E)}{n(S)} = \left(\frac{3300}{11440}\right) = \boxed{\frac{15}{52}}$

(A) PROBABILITY [ANSWERS]

6 (d) $n(S) = {}^{22}C_1$ [Since; Total no of balls = (8+6+8) = 22]

$= 22$

$n(E)$ = Number of getting blue balls) $= {}^{8}C_1 = 8$

$P(E) = \frac{n(E)}{n(S)} = \left(\frac{8}{22}\right) = \boxed{\frac{4}{11}}$

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7. (c) $n(S) = {}^{12}C_3 = 220$

$n(E$ = All are in same colour$) = {}^{5}C_3 + {}^{4}C_3 + {}^{3}C_3 = 15$

$P(E$ = All are in same Colour$) = \frac{n(E)}{n(S)} = \left(\frac{15}{220}\right) = \frac{3}{44}$

$\therefore \quad P(\bar{E}) = 1 - P(E) = \left(1 - \frac{3}{44}\right) = \boxed{\frac{41}{44}}$

[since; $\bar{E}$ = Balls are not in same colour]

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8 (a) $n(S) = 6^2 = 36$

$n(E) = \{(2,1); (2,2); (2,3); (2,4); (2,5); (2,6)$

$(4,1); \quad - \quad - \quad - \quad (4,6)$

$(6,1) \quad - \quad - \quad - \quad (6,6)$

$(1,2); \quad (1,4); \quad (1,6)$

$(3,2); \quad (3,4); \quad (3,6)$

$(5,2); \quad (5,4); \quad (5,6)\} = 27$

$\therefore \quad P(E) = \frac{n(E)}{n(S)} = \frac{27}{36} = \boxed{\frac{3}{4}}$

(A) PROBABILITY (ANSWERS)

1 (c) $n(S) = 6$

$n(E) = \{2, 4, 6\} = 3$

$\therefore P(E) = \frac{n(E)}{n(S)} = \left(\frac{3}{6}\right) = \boxed{\frac{1}{2}}$

10 (d) Total no. of balls = 12

$\therefore n(S) = {}^{12}C_3 = 220$ and $n(E) = ({}^3C_1 \times {}^5C_1 \times {}^4C_1)$

$= (3 \times 5 \times 4) = 60$

$\therefore P(E) = \frac{n(E)}{n(S)} = \frac{60}{220} = \boxed{\frac{3}{11}}$

11. (a) Total no of [redacted] plates = 11

$\therefore n(S) = {}^{11}C_1 = 11$ and $n(E) = {}^3C_1 = 3$

$P(E) = \frac{n(E)}{n(S)} = \boxed{\frac{3}{11}}$

12. (b) Total no of dresses = 12

$n(S) = {}^{12}C_3 = 220$ and $n(E) = ({}^4C_1 \times {}^8C_2) = \left(\frac{4 \times 8 \times 7}{2}\right)$

$= 112$

$\therefore P(E) = \frac{n(E)}{n(S)} = \left(\frac{112}{220}\right) = \boxed{\frac{28}{55}}$

13. (a) Total no. of plates = 11

$\therefore n(S) = {}^{11}C_1 = 11$ and $n(E) = ({}^2C_1 + {}^6C_1) = (2+6) = 8$

Now; $P(E) = \frac{n(E)}{n(S)} = \boxed{\frac{8}{11}}$

14. (d) Total no. of pens = 12

$n(S) = {}^{12}C_2 =$ [redacted] 66 and $n(E) = ({}^4C_2 + {}^3C_2 + {}^5C_2)$

$= (6 + 3 + 10) = 19$

$\therefore P(E) = \frac{n(E)}{n(S)} = \boxed{\frac{19}{66}}$

(A) PROBABILITY [ANSWERS]

15. (a) $n(S) = {}^{10}C_2 = \frac{(10\times9)}{2} = 45$

$n(E) = {}^{6}C_2 = \frac{(6\times5)}{2} = 15$

$P(E) = \frac{n(E)}{n(S)} = \frac{15}{45} = \boxed{\frac{1}{3}}$

16. (d) $n(S) = {}^{12}C_2 = \left(\frac{12\times11}{2}\right) = 66$

$n(E) = {}^{4}C_2 = {}^{4}C_2 = \frac{(4\times3)}{2} = 6$

$P(E) = \frac{n(E)}{n(S)} = \frac{6}{66} = \boxed{\frac{1}{11}}$

17. (a) The Required answer =

$$\left(\frac{{}^{6}C_1}{{}^{13}C_1} * \frac{{}^{3}C_1}{{}^{8}C_1}\right) + \left(\frac{{}^{7}C_1}{{}^{13}C_1} \times \frac{{}^{5}C_1}{{}^{8}C_1}\right)$$

$$= \left(\frac{6}{13} \times \frac{3}{8}\right) + \left(\frac{7}{13} \times \frac{5}{8}\right) = \boxed{\frac{53}{104}}$$

18. $n(S) = {}^{9}C_4 = \frac{9\times\overset{2}{\cancel{8}}\times7\times\cancel{6}}{\cancel{4}\times\cancel{3}\times\cancel{2}} = 126$

$n(E) = \left({}^{4}C_2 \times {}^{5}C_2\right) = \left(\frac{\overset{2}{\cancel{4}}\times3}{\cancel{2}}\right) \times \left(\frac{5\times\overset{2}{\cancel{4}}}{\cancel{2}}\right) = 60$

$\therefore P(E) = \frac{n(E)}{n(S)} = \frac{60}{126} = \boxed{\frac{10}{21}}$

19. (b) $n(S) = {}^{10}C_2 = \frac{10\times9}{2} = 45$

$n(E) = \left({}^{2}C_1 \times {}^{8}C_1\right) = (2\times8) = 16$

$P(E) = \frac{n(E)}{n(S)} = \boxed{\frac{16}{45}}$

20. (b) (i) If 2 men and 1 Women $= \frac{\left({}^{5}C_2 \times {}^{3}C_1\right)}{{}^{8}C_3} = \frac{30}{56}$

(ii) If 2 Women and 1 men $= \frac{\left({}^{5}C_1 \times {}^{3}C_2\right)}{{}^{8}C_3} = \frac{15}{56}$

$\therefore P(E) = \frac{30+15}{56} = \boxed{\frac{45}{56}}$

NUMBER SYSTEM

NUMBER SYSTEM (B) [ANSWERS] {15}

1. (d) Lets digit at tens and Ones place be $2x$ and $3x$.

So, the number is $= \{(2x \times 10) + 3x\}$ [Since; $N = 10a + b$]

$= 23x$

After interchanging number will be $= \{(3x \times 10) + 2x\} = 32x$

∴ According to the question :

$32x - 23x = 27$

$\Rightarrow x = 3$

∴ The number is $= \{(2 \times 3) \times 10 + (3 \times 3)\} = \boxed{69}$

2. (d) Divisor $= (5 \times 46) = 230$

Also; $10Q = 230 \Rightarrow Q = 23$ [Since; Q = Quotient]

and Remainder = 46.

∴ Dividend $= \{(230 \times 23) + 46\} = \boxed{5336}$

3. (c) Let the number is x.

$\therefore \frac{2}{3}x = \frac{25}{216} \times \frac{1}{x}$

$\Rightarrow x^2 = \left(\frac{25}{216} \times \frac{3}{2}\right) = \frac{25}{144}$

$\boxed{x = \frac{5}{12}}$

4. (d) Let the odd numbers are x and $(x+2)$.

$\therefore x(x+2) = 6723$

$\Rightarrow x^2 + 2x + 1 = 6724$

$\Rightarrow (x+1)^2 = 6724$

$\Rightarrow (x+1) = 82$

$\therefore x, (x+1); (x+2)$

Here; $(x+2) = (82+1)$

$= \boxed{83}$

[6] NUMBER SYSTEM (E) [ANSWERS]

5. (a) Let the number is x.

$\therefore \quad \frac{3x}{5} + 60 = x \Rightarrow \frac{2x}{5} = 60 \Rightarrow \boxed{x = 150}$

6. (b) (i) $.01 = \frac{1}{10^2} = 10^{-2}$

(ii) $(0.0001)^2 = \left(\frac{1}{10^4}\right)^2 = \frac{1}{10^8} = 10^{-8}$

$\therefore \quad \frac{10^{-2}}{10^{-8}} = \boxed{10^6}$

7. (c) Let the fraction is $\frac{x}{y}$.

$\therefore \quad \frac{(x+x)}{(y+2y)} = 1\frac{1}{15} \Rightarrow \frac{2x}{3y} = \frac{16}{15}$

$\Rightarrow \quad \frac{x}{y} = \frac{8}{5} = \boxed{1\frac{3}{5}}$

8. (b) According to given option :

(i) 5^{th} digit $= 1$; (ii) Second digit $= (1+5) = 6$

(iii) 3^{rd} digit $= 4$; (iv) 4^{th} digit $= 2$

(v) 1^{st} digit $= (4 \times 2) = 8$

$\therefore$ The Required answer is $= \boxed{86421}$

9. (c) The number is n.

$\therefore \quad n = 7q + 2$ [Since; q = Quotient]

Now; $\frac{3n}{7} \Rightarrow \frac{(21q + 6)}{7} \Rightarrow$ Remainder is $\rightarrow \boxed{6}$

10. The sum of 3 consecutive even number is 40 more than the average of these numbers. Which of the following is the 2nd largest number?

10. (b) According to question:

$$(x + x+2 + x+4) = 40 + \frac{(x+2+2+x+4)}{3}$$

$$\Rightarrow \quad 3x+6 = 40 + \frac{(3x+6)}{3}$$

$$\Rightarrow \quad \frac{2}{3}(3x+6) = 40$$

$$\Rightarrow \quad x = 18 \Rightarrow \text{The Required answer is} = (18+2) = \boxed{20}$$

11. (a) $27! = (1 \times 2 \times 3 \times \dots \times 27)$. The factorial after 5 should end with Zero. Then the unit digit is $\boxed{0}$.

12. (d) LCM of 12, 16, 18, 21 is 1008.

∴ The number is $= (1008 \times 2) = 2016$

∴ The least number $(N) = (2016 - 200) = \boxed{16}$

13. (d) Let the maximum mark is $5x$.

∴ According to the question: $2x = (198 + 36) = 234$

$$x = 117$$

Now; Max. mark $= 5x$

$= \boxed{585}$

14. (a) Wrongly attempted $= \frac{(30 \times 3) - 30}{(3+2)} = 12$ questions

∴ Correctly attempted $= (30 - 12) = \boxed{18 \text{ questions}}$

15. (a) By option test: (i) All numbers will be divisible by 5 because in end it is 5 and, [redacted] and 0.

(ii) The number divisible by 11; then → $(y+4+0)-(7+x+1)$ as 0 or multiple of 11.

∴ from the option; $x=1$ and $y=5$ satisfies the above conditions.

∴ The Required answer is = **1 and 5**

16. (b) Let The Smaller no = x; then the larger = $(x+2577)$

∴ $x + 2577 = 26x + 2$

⇒ $x = 103$

∴ The Required number is = $(x+2577) = (103+2577)$ = **2680**

17. (a) $(58 \div 4)$ → Remainder is 2.

∴ $(9)^2 = 81$ ⟶ The unit place is **1**

18. (b) The divisor is = $\{(17+11) - 4\}$ = **24**

19. (c) The number is = $100a + 10b + c$

Now; $c = 2b$; $b = \frac{c}{2}$ and $c = 1{\cdot}5a$; $a = \frac{c}{1{\cdot}5}$

∴ $a+b+c = 13 \Rightarrow \left(\frac{c}{1{\cdot}5} + \frac{c}{2} + c\right) = 13 \Rightarrow c = 6$

$b = 3$; $a = 4$. The Required number is → **436**

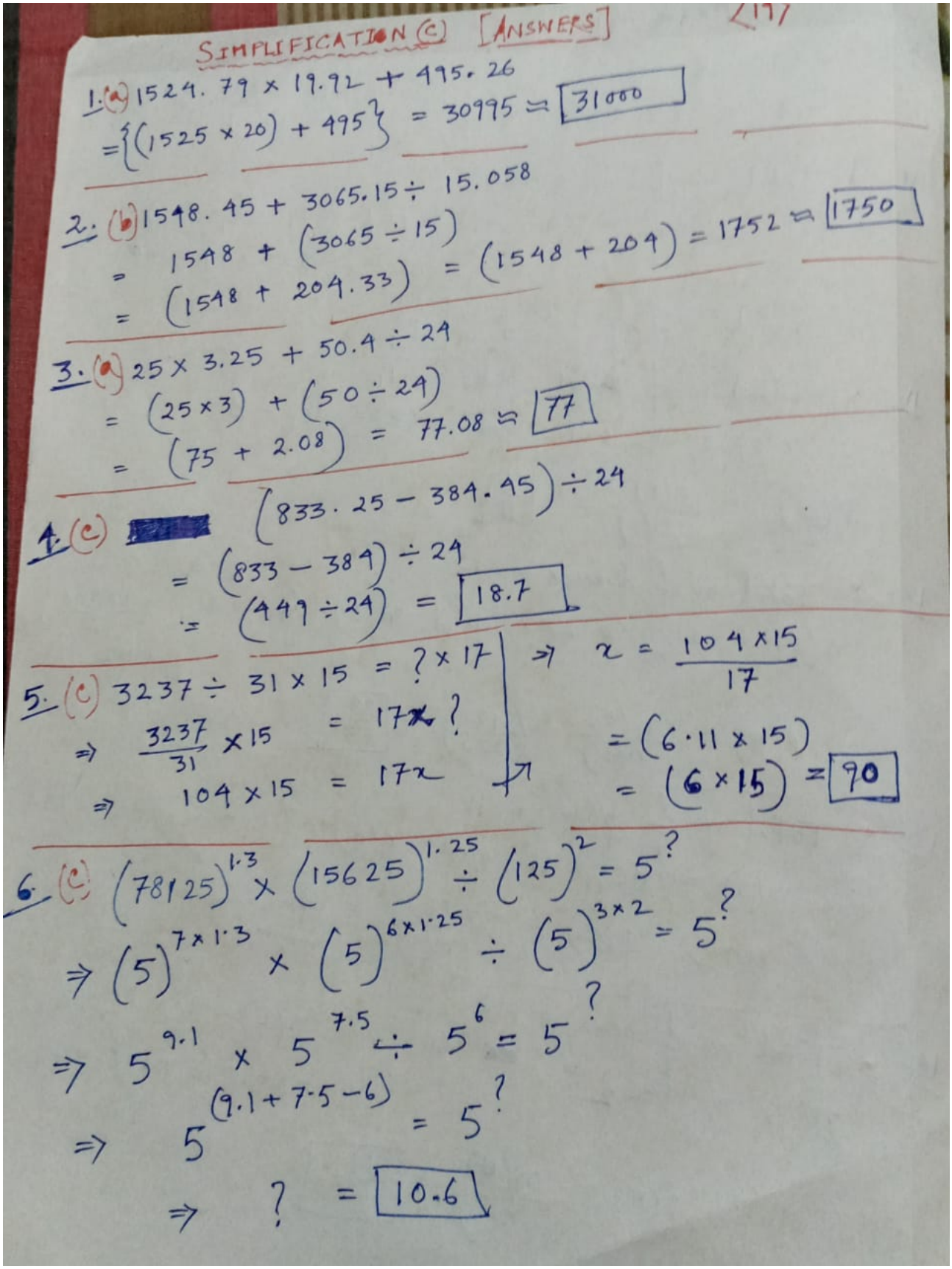
20. (a) LCM of 2, 3, 4, 5, 6 is 60.

∴ The number (N) = $60x + 1$. The N is exactly divisible by 7. Now; $x = 5$.

∴ The Required answer is $N = \{(60 \times 5) + 1\}$ = ~~391~~ 301

301 → $(3+0+1)$ = **4**

SIMPLIFICATION



SIMPLIFICATION (C) [ANSWERS]

1. (a) $1524.79 \times 19.92 + 495.26$
$= \{(1525 \times 20) + 495\} = 30995 \approx \boxed{31000}$

2. (b) $1548.45 + 3065.15 \div 15.058$
$= 1548 + (3065 \div 15)$
$= (1548 + 204.33) = (1548 + 204) = 1752 \approx \boxed{1750}$

3. (a) $25 \times 3.25 + 50.4 \div 24$
$= (25 \times 3) + (50 \div 24)$
$= (75 + 2.08) = 77.08 \approx \boxed{77}$

4. (c) [redacted] $(833.25 - 384.45) \div 24$
$= (833 - 384) \div 24$
$= (449 \div 24) = \boxed{18.7}$

5. (c) $3237 \div 31 \times 15 = ? \times 17$
$\Rightarrow \frac{3237}{31} \times 15 = 17 \times ?$
$\Rightarrow 104 \times 15 = 17x$
$\Rightarrow x = \frac{104 \times 15}{17}$
$= (6.11 \times 15)$
$= (6 \times 15) = \boxed{90}$

6. (c) $(78125)^{1.3} \times (15625)^{1.25} \div (125)^2 = 5^?$
$\Rightarrow (5)^{7 \times 1.3} \times (5)^{6 \times 1.25} \div (5)^{3 \times 2} = 5^?$
$\Rightarrow 5^{9.1} \times 5^{7.5} \div 5^6 = 5^?$
$\Rightarrow 5^{(9.1 + 7.5 - 6)} = 5^?$
$\Rightarrow ? = \boxed{10.6}$

SIMPLIFICATION (c) [ANSWERS]

7. (b) $\sqrt{7580} \times \sqrt{1325} \div \sqrt{665} - \sqrt{6395} = ?$

$= 87 \times 36 \div 26 - 80$ [Since, Taken the approximate Values]

$= \frac{87 \times 36}{26} - 80$

$= (87 \times 1.4) - 80 = (121.8 - 80) = 41.8 \approx \boxed{41}$

8. (d) 79.008% of $799.998 + 42.99\%$ of $199.99 - 53.93\%$ of 699.72

$= \left(\frac{79 \times 800}{100}\right) + \left(\frac{43 \times 500}{100}\right) - \left(\frac{54 \times 700}{100}\right)$

$= (632 + 215 - 378) = \boxed{469}$

9. (b) $(63.83)^2 + (56.96)^2 - (77.81)^2$

$= (64)^2 + (57)^2 - (78)^2$

$= (4096 + 3249 - 6084) = 1261 \approx \boxed{1260}$

10. (d) $(29.9\%$ of $260) + (60.01\%$ of $510) - 103.87$

$= (30\%$ of $260) + (60\%$ of $510) - 104$

$= \left(\frac{30 \times 260}{100}\right) + \left(\frac{60 \times 510}{100}\right) - 104$

$= (78 + 306 - 104)$

$= \boxed{280}$