

REG-PAC-2425-ASM-SET 4-MATH**Suggested solutions****Multiple Choice Questions**

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|-------|-------|-------|-------|-------|
| 1. B | 2. B | 3. C | 4. B | 5. C |
| 6. A | 7. D | 8. A | 9. D | 10. B |
| 11. C | 12. B | 13. A | 14. C | 15. B |
| 16. D | 17. B | 18. B | 19. B | 20. D |
| 21. C | 22. C | 23. D | 24. B | |

1. ☐ B

$$\begin{aligned}\text{Required number} &= 4!(2!)^4 \\ &= 384\end{aligned}$$

2. ☐ B

$$\begin{aligned}\text{Required number} &= (C_3^4 C_2^4 + C_4^4 C_1^4) \times 5! \\ &= 3360\end{aligned}$$

3. ☐ C

$$\begin{aligned}\text{Required number} &= C_5^8 5! \\ &= 6720\end{aligned}$$

4. ☐ B

$$\begin{aligned}\text{Required number} &= C_3^4 C_3^6 C_3^4 \times C_3^7 \times 3! \times 6! \\ &= 48\,384\,000\end{aligned}$$

5. ☐ C

$$\text{Required number} = 3!5! = 720$$

6. ☐ A

$$\text{Required number} = 6! \times 5! = 86\,400$$

7. ☐ D

$$\begin{aligned}\text{Required number} &= \frac{5!}{2!} \\ &= 60\end{aligned}$$

8. ☐ A

$$\begin{aligned}\text{Required number} &= 3!2! \\ &= 12\end{aligned}$$

9. D

$$\begin{aligned}\text{Required number} &= 8! \\ &= 40\,320\end{aligned}$$

10. B

$$\begin{aligned}\text{Required number} &= 5! \times 2! \\ &= 240\end{aligned}$$

11. C

$$\begin{aligned}\text{Required number} &= 7!2! \\ &= 10\,080\end{aligned}$$

12. B

$$\text{Number of ways} = 10! - (8 \cdot 2!)8! = 2\,983\,680$$

13. A

$$\begin{aligned}\text{Number of queues} &= 7!5! \\ &= 604\,800\end{aligned}$$

14. C

$$\begin{aligned}\text{Required number} &= {}^9C_2 {}^7C_2 {}^{10}C_2 \times 6! \\ &= 24\,494\,400\end{aligned}$$

15. B

$$\begin{aligned}\text{Required number} &= {}^{26}C_2 \times 2! \times 10^3 \\ &= 650\,000\end{aligned}$$

16. D

$$\begin{aligned}\text{Required number} &= {}^5C_4 4!4! \\ &= 2880\end{aligned}$$

17. B

$$\begin{aligned}\text{Required number} &= 2!5! \\ &= 240\end{aligned}$$

18. B

$$\text{Number of arrangements} = {}^4C_2 2! \times {}^5C_4 4! = 1440$$

19. B

$$\begin{aligned}\text{The unit digit is } &5. \\ \text{Required number} &= 1 \times {}^6C_3 \times 3! \\ &= P_3^6\end{aligned}$$

20. D

$$\begin{aligned}\text{Required number} &= C_2^{20} C_2^{12} \times 4! \\ &= 300\,960\end{aligned}$$

21. C

$$\begin{aligned}\text{Required number} &= (C_3^{26} C_4^{10} + C_4^{26} C_3^{10} + C_5^{26} C_2^{10}) \times 7! \\ &= 2.67 \times 10^{10}\end{aligned}$$

22. C

$$\begin{aligned}\text{Required number} &= 5! \\ &= 120\end{aligned}$$

23. D

$$\text{Required number} = 3 \times C_4^7 \times 4! = 2520$$

24. B

$$\text{Required number} = 7!6! = 3\,628\,800$$

Conventional Questions

25. (a) Required number = $11!$
 $= 39\,916\,800$ 1A
- (b) Required number = $C_4^8 \times C_3^5 \times 3!4!$ 1M+1M
 $= 100\,800$ 1A
26. (a) The number of different patterns = C_4^{16} 1M
 $= 1820$ 1A
- (b) (i) The number of different patterns = $C_4^{16} \times 4!$ 1M
 $= 43\,680$ 1A
- (ii) The number of different patterns = $C_4^{16} \times C_4^{12} \times C_4^8 \times C_4^4$ 1M+1A
 $= 63\,063\,000$ 1A
- (c) The number of different patterns = $C_5^{16} \times 3!$ 1M+1A
 $= 26\,208$ 2A
27. (a) Number of ways = C_5^{12} 1M
 $= 792$ 1A
- (b) Number of ways = $C_6^{12} \cdot 6!$ 1M
 $= 665\,280$ 1A
- (c) Number of ways = $C_4^{12} \cdot C_1^4 \cdot C_3^8 \cdot 3!$ 1M
 $= 665\,280$ 1A
28. (a) Number of arrangements = $8! = 40\,320$ 1A
- (b) Number of arrangements = $C_2^4 \times 2! \times 6!$ 1M
 $= 8640$ 1A
- (c) Number of arrangements = $C_2^4 C_2^4 \times 4! \times 4!$ 1M+1M
 $= 20\,736$ 1A
29. (a) Required number of ways = $9!$ 1M
 $= 362\,880$ 1A
- (b) Required number of ways = $C_2^3 \times (C_1^3)^2 \times 2! \times 7!$ 1M+1A
 $= 272\,160$ 1A
- (c) Required number of ways = $C_1^3 \times 2! \times 7!$ 1M
 $= 30\,240$ 1A

30. (a) Required number = $8! = 40\,320$.

1A

(b) Required number = $C_2^4 \cdot 2! \cdot 6!$
 $= 8640$

1M

1A