

REGULAR QUIZ 07

Form 5

Permutation and Combination

Part 1 – MC (10 marks @3 marks)

1.	B	Number of teams = $C_3^{15} C_2^{13} = 35490$
2.	C	$7 \times 6 \times 5 \times 1 + 6 \times 6 \times 5 \times 3 = 750$
3.	B	Number of study groups = $C_2^{26} C_3^{18} + C_1^{26} C_4^{18} + C_5^{18} = 353328$
4.	A	Number of ways = $C_2^6 C_1^4 C_1^3 + C_1^6 C_2^4 C_1^3 + C_1^6 C_1^4 C_2^3 = 360$
5.	D	Number of queues of selecting 3 boys 3 girls = $C_3^{10} C_3^6 \times 3 \times P_3^4 = 345600$ Number of queues of selecting 4 boys 2 girls = $C_4^{10} C_2^6 \times 4 \times P_2^5 = 1512000$ Number of queues of selecting 5 boys 1 girl = $C_5^{10} C_1^6 \times 6! = 1088640$ Number of queues of selecting 6 boys = $P_6^{10} = 151200$ Total number of queues = $345600 + 1512000 + 1088640 + 151200 = 3097440$

Part 2 – Short Questions (35 marks)

- Number of photos
 $= C_4^8 (5 \times 2! - 4 \times 2!)$ 1M+1M
 $= 13440$ 1M for C_4^8 , 1M for next to each other
1A
- (a) Number of ways
 $= 6 \times 5!$ 1M
 $= 86400$ 1A
- (b) Number of ways
 $= 2!(9! - 8 \times 2)$ 1M
 $= 564480$ 1A
- (c) Number of ways
 $= 3 \times P_2^5 \times 7! + 3 \times C_1^5 \times 7 \times 2$ 1M+1M
 $= 907200$ 1A

3. (a) Number of possible numbers
 $= 10^4$ 1M
 $= 10000$ 1A
- (b) Number of possible numbers
 $= 5^4 \times 4$ 2M
 $= 2500$ 1A
4. (a) Number of possible numbers
 $= 6 \times 7^3 - 5 \times 6^3 - (1 \times 6^3 + 5 \times 1 \times 6^2 \times 3)$ 1M+1M 1M for no "2" or one "2", 2M for all
 $= 222$ 1A
- (b) Number of possible numbers
 $= 3 \times 7^3 + 1 \times 1 \times 7^2 \times 3 + 1 \times 1 \times 3 \times 7 - 1$ 1M+1M 1M for $1 \times 1 \times 7^2 \times 3$, 2M for all
 $= 1196$ 1A
5. (a) Number of combinations
 $= \frac{C_3^{12} C_3^9 C_3^6 C_3^3}{4!}$ 1M
 $= 15400$ 1A
- (b) Number of combinations
 $= \frac{(C_2^2 C_1^9)(C_1^1 C_2^8) C_3^6 C_3^3}{2}$ 1M
 $= 2520$ 1A
- (c) Number of combinations
 $= (C_1^1 C_2^9)(C_1^1 C_2^7)(C_1^1 C_2^5)(C_3^3)$ 1M
 $= 7560$ 1A
6. (a) Number of combinations
 $= C_2^8 C_6^8$ 1M+1M 1M for C_2^8 , 1M for C_6^8
 $= 784$ 1A
- (b) Number of combinations
 $= C_3^8 C_5^6 C_1^6$ 1M
 $= 2016$ 1A
7. Number of combinations
 $= 4^3 \times 3 \times 2 + 4^2 \times 3^2 \times 3$ 1M+1M 1M for $4^3 \times 3 \times 2$, 1M for $4^2 \times 3^2 \times 3$
 $= 816$ 1A