



SCHOOL OF COMPUTING
SEMESTER 1, 2020/2021

SECI1013-07 STRUKTUR DISKRIT
(DISCRETE STRUCTURE)

SECTION: 07
ASSIGNMENT 02

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Assignment : 2

1. a) Total digit = 6

$$\therefore \text{Total number} = 6^3 = 216$$

b) ${}^6P_3 = 120$

c) 1st digit = 5 ways

2nd digit = 6 ways

3rd digit = 3 ways

$$\therefore \text{Total} = 5 \times 6 \times 3 = 90 \text{ ways}$$

2.

a) All men together and 5 women

Then, we have 6 members

$$\therefore \text{They can seat } (6-1)! = 5! \text{ ways}$$

Only men can arranged themselves = 5! ways

$$\therefore \text{Total ways} = 5! \times 5!$$

$$= 14400 \text{ ways}$$

b) couple can arranged themselves = $2!$ way

Since the couple insisted to sit next to each other, they can

$$\text{sit} = (9-1)! \times 2!$$

$$= 80640 \text{ ways}$$

c) The women can sit = $(5-1)!$ ways

$$= 4! \text{ ways}$$

Men can sit among the women = $5!$

$$\therefore \text{Total ways} = 4! 5!$$

$$= 2880 \text{ ways}$$

d) Anita and her husband can stand $2!$ ways

Anita and her husband and the 10 friends

can stand = $11!$ ways

$$\therefore \text{total ways} = 11! \times 2!$$

$$= 7983360$$

3.

a) If no ties, then $5! = 120$ ways

b) 2 sprinters tie,

$$4! = 24 \text{ ways}$$

c) 2 group of sprinters ties

$$3! = 6 \text{ ways}$$

4.

$$a) n = 6$$

$$n = 12$$

$$C(n+n-1, n)$$

$$= C(6+12-1, 12)$$

$$= C(17, 12)$$

$$= 6188$$

b)

$$C(n+n-1, n)$$

$$n = 6$$

$$n = 24$$

If we choose 2 of each kind, we will get the remaining 12 enoissants,

$$\text{Then, } n = 6$$

$$n = 12$$

$$C(n+n-1, n)$$

$$= C(17, 12) = 6188$$

$$c) n = 6$$

$$2 \text{ dozen} = 24$$

$$n = 24 - 5 - 3 = 16$$

$$c(n+r-1, r)$$

$$c(21, 16)$$

$$= 20,349$$

5.

a)

$$\frac{4!}{2!(4-2)!} = \frac{4!}{2!2!} = 6$$

$$403 \times 301 \times 2 = 36$$

$$301 \times 403 \times 2^3 = 96$$

$$\frac{3!}{1!(3-1)!} = \frac{3!}{1!2!} = 3$$

$$96 + 36 = 132$$

$$2 \times 132$$

$$= 264$$

b) $10 \text{ penalty} = 2^{10}$
 $= 1024$

Game
not finish

$$1024 - 264$$

$$= 760$$

$$= 760 \times 264 = 200640$$

c)

~~760~~

760 = First round

760 = Second round

10 penalty kick

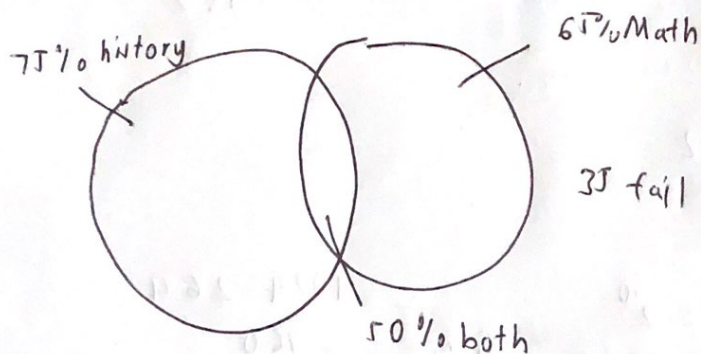
$$760^2 \times 10 = 5776000$$

6. 4^{10} = possible answer sheet

$$\text{minimum} = 2 \times 4^{10} + 1$$

$$\text{number} = 2097153 \text{ student}$$

7. $\frac{100}{25} = 4$



$$75 + 65 - 50 = 90$$

$$100 - 90 = 10$$

$$35 \times 10 = 350 \text{ student}$$

8.

$$9^3 = 729$$

$$9 \times 10^2 = 900$$

$$900 - 729 = 171$$

$$\frac{171}{900}$$

$$= 0.19$$

Answer to the question no 9

①

Blue car = 2.

Yellow car = 4

$\therefore$ total car = $2+4 = 6$ cars

②

$\therefore$ we can ~~arr~~ park them in = $\frac{10P_6}{4!2!}$ ways.

$\Rightarrow 3150$ ways.

③ Here, Parking lot = 10.

~~lot~~ Blue car = 2.

Yellow car = 4

$\therefore$ total car = $(4+2) = 6$.

④

$\therefore$ empty place = $(10-6) = 4$.

$\therefore$ they are $(10-4+1)$ lot to arrange between them

$\Rightarrow 7$

$\therefore$ they can arrange between them in = $\frac{7!}{4!2!}$ ways

$\Rightarrow 105$ ways

$\therefore$ probability that the empty lots are together = $\frac{105}{3105}$

$\Rightarrow \frac{1}{30}$

Answer to the question no 10

① Receiving probability = $\sum P_i P_{ij}$

$$\Rightarrow (0.4 \times 0.6 + 0.1 \times 0.8 + 0.5 \times 1.0)$$

$$\Rightarrow 0.24 + 0.08 + 0.5$$

$$\Rightarrow 0.82$$

$$\textcircled{b} P(B/A) = \frac{P(B \cap A)}{P(A)}$$

$$\Rightarrow \frac{0.4 \times 0.6}{0.82}$$

$$\Rightarrow \frac{12}{41}$$

Answer to the question no 11

Here,

$A \rightarrow$ Light truck.

$A' \Rightarrow$ car.

$B \Rightarrow$ Fatal Accident.

$B' =$ Not fatal accident.

Now,

$$P(B|A) = \frac{25}{100000} =$$

$$P(B|A') = \frac{20}{100000}$$

$$P(A) = 0.4$$

$$\therefore P(A') = 0.6$$

~~We have the~~

Bayes theorem =

$$\frac{P(B|A) P(A)}{P(B|A) P(A) + P(B|A') P(A')}$$

$$\Rightarrow \frac{\frac{25}{100000} \times 0.4}{\left(\frac{25}{100000} \times 0.4\right) + \left(\frac{20}{100000} \times 0.6\right)}$$

$$\Rightarrow 0.4545$$

$$\approx 45.45\%$$

Answer to the question no 2

Here to tel number 9.

total boxes 4

$\therefore$ we can arrange them $= 4^9 = 262144$

This disallowed ways can be counted by inclusion exclusion. If we put the letters in 2 boxes. then we have 4 choices for which box the letter get into and two choices per letter.

$\therefore 4 \times 3^9 = 78732$ disallowed way.

$4 \times 1^9 = 4$ put all letter in one box.

$\therefore$ allow ~~letter~~ to ~~arr~~ arrange $= 262144 - 78732 + 4$

$\Rightarrow 183416$