

DESK
NUMBER

138

COLLEGE

SID

NAME

MELAN

EXAMINATION

MATHS 1B

SUBJECT OF PAPER

PAK 9

Numbers
of
questions
attempted

3

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Read carefully any instructions on one side of the paper.
Start each answer on a fresh sheet.
Tie the sheets securely together.
Write your name, college, subject of the paper in the top right-hand corner.
Write the numbers of the questions in the right-hand margin.

Candidates are expected to write clearly and legibly. Those who do not may find this a grave disadvantage.

It is forbidden to remove any writing-paper, whether written on or not, or blotting-paper, from the examination-room.

Neil ~~fgf~~

A522, A6231

I had occasion~~all~~ to look at the graph whose $n!$ vertices are the perms of n things, two vertices ~~both~~ being joined just if you can get from one to the other by a single cycle (of length 2 or more).

$$\text{Its valence } \Delta_n = \frac{n(n-1)}{2} + \frac{n(n-1)(n-2)}{3} + \dots + \frac{n!}{n}$$

is not in the Good Book. $\leftarrow$ Here is some info:

P_n is the (total) # of perms (seq. 589 in)

$$P_n = n P_{n-1} + 1 = A522$$

$$\Delta_{n+1} - \Delta_n = n P_{n-1} = P_n - 1$$

A522

$n =$	0	1	2	3	4	5	6	7	8	9
$P_n =$	1	2	5	16	65	326	1957	13700	109601	986410
$\Delta_n =$	?	0	1	5	20	84	409	2365	16064	125664

A6231

$n =$	10	11	12	13	14
$P_n =$	9864101	108505112	1302061345	16926797486	236975164805
$\Delta_n =$	1112073	10976173	119481284	1421542628	18348340113

$n =$	15	16	17
$P_n =$	3554627472076	56874039553217	
$\Delta_n =$	255323504917	3809950976992	60683990530208

R.K. Guy

via Calgary
wrote asking you to ref. a paper for
monthly Res. Problems meet. - doubt if you have it yet

77:07:09