

APPENDIX 6 Details of Calculations of -

IV Prediction of PSc Mathematics (1965) from standardized (i) English test score (T_e) and (ii) Numerical test score (T_n)

	N	T_e	T_n	T_n^2	T_e^2	$T_e T_n$	P_m
1	352	4107	6296	122722	52541	76948	18888
T_e		52541	76948	1560336	724563	1023242	227242
T_n			122722	2564234	1023242	1560336	353445
T_n^2				56702782	21499022	33840454	7187815
T_e^2					10631837	14576902	2980010
$T_e T_n$						21499022	4453015
	352	4107	6296	122722	52541	76948	13888
1		11.6676136364	17.8363636364	348.6420454545	149.2642045455	218.6022727273	53.6590909091
		4622.110795	3436.704545	129467.119314	111534.911930	125442.465906	6864.112336
	1	.7547360057	27.7931717305	24.1307309316	27.1396492792	1.4850603848	
		7476.229177	272221.517107	-710.422492	89333.873120	10426.426722	
		1	36.4116067956	-.0950241726	11.9490549320	1.3946103678	
			434312.5130	106978.9474	273912.0218	32245.60602	
			1	.2463179029	.6306795536	.0742451692	
				71509.14260	5321.039241	-11880.3220	
				1	.0744106145	-.1661371069	
					32947.77803	-6272.931963	
					1	-.1903901367	

$$(i) \therefore b_{T_e T_n} = -.1903901367$$

$$b_{T_e^2} + b_{T_e T_n} (.0744106145) = -.1661371069$$

$$b_{T_e^2} = -.1519700599$$

$$b_{T_n^2} + b_{T_e T_n} (.2463179029) + b_{T_e^2} (.6306795536) = .0742451692$$

$$b_{T_n^2} = .2317532821$$

$$b_{T_n} + b_{T_n^2} (36.4116067956) + b_{T_e^2} (-.0950241726) + b_{T_e T_n} (11.9490549320) = 1.3946103678$$

$$b_{T_n} = -4.7833576409$$

$$b_{T_e} + b_{T_n} (.7547360057) + b_{T_n^2} (27.7931717305) + b_{T_e^2} (24.1307309316) + b_{T_e T_n} (27.1396492792) = 1.4850603848$$

$$b_{T_e} = 7.4885831737$$

$$c + T_e (11.6676136364) + T_n (17.8363636364) + T_n^2 (348.6420454545) + T_e^2 (149.2642045455) + T_e T_n (218.6022727273) = 53.6590909091$$

$$c = 35.3465382948$$

$$P_m = .2317532821 T_n^2 - .1903901367 T_e T_n - .1519700599 T_e^2 - 4.7833576409 T_n + 7.4885831737 T_e + 35.3465382948$$

$$(ii) \quad b_{T_e}^2 = -.1461371069$$

$$b_{T_n}^2 + b_{T_e}^2 (.2463179029) = .0742451692$$

$$b_{T_n}^2 = .1151677130$$

$$b_{T_n} + b_{T_n}^2 (.36.4116067956) + b_{T_e}^2 (-.0950241726) = 1.3946103678$$

$$b_{T_n} = -2.146181546$$

$$b_{T_e} + b_{T_n} (.7547860057) + b_{T_n}^2 (.27.7931717805) + b_{T_e}^2 (.24.1307309316) = 1.4850603848$$

$$b_{T_e} = 4.4176285727$$

$$c + b_{T_e} (11.6676136364) + b_{T_n} (17.883636364) + T_n^2 (348.6420454545) + T_e^2 (149.2642045455) = 53.6590909091$$

$$P_m = .1151677130T_n^2 - .1661371069T_e^2 - 2.8146181546T_n + 4.4176285727T_e + 37.1052074244$$

$$(iii) \quad b_{T_n}^2 = .0742451692$$

$$b_{T_n} + b_{T_n}^2 (.36.4116067956) = 1.3946103678$$

$$b_{T_n} = -1.3087755396$$

$$b_{T_e} + b_{T_n} (.7547860057) + b_{T_n}^2 (.27.7931717805) = 1.4850603848$$

$$b_{T_e} = .4093971057$$

$$c + b_{T_e} (11.6676136364) + T_n (17.883636364) + T_n^2 (348.6420454545) = 53.6590909091$$

$$c = 46.4066512243$$

$$P_m = .0742451692T_n^2 - 1.3087755396T_n + .4093971057T_e + 46.4066512243$$

$$(iv) \quad b_{T_n} = 1.3946103678$$

$$b_{T_e} + b_{T_n} (.7547860057) = 1.4850603848$$

$$b_{T_e} = .4324279958$$

$$c + b_{T_e} (11.6676136364) + b_{T_n} (17.883636364) = 53.6590909091$$

$$c = 23.6691799531$$

$$P_m = .4324279958T_e + 1.3946103678T_n + 23.6691799531$$

$$(v) \quad b_{T_e} = 1.4850603848$$

$$c + b_{T_e} (11.6676136364) = 53.6590909091$$

$$c = 36.3319801102$$

$$P_m = 1.4850603848T_e + 36.3319801102$$

IV Prediction of PScE Mathematics (1965) from standardized test in English (T_e) and in Mathematics (T_n)

$$(i) \quad P_m = .231753282T_n^2 - .190390137T_eT_n - .151970060T_e^2 - 4.783357641T_n + 7.488583174T_e + 35.346538295$$

$$\begin{aligned} \therefore \text{Reg. S.S.} &= (.231753282)(7187815) - (.190390137)(4453015) \\ &\quad - (.151970060)(2980010) - (4.783357641)(353445) \\ &\quad + (7.488583174)(227242) + (35.346538295)(18888) - C.F. \\ &= 30296.56 \end{aligned}$$

$$(ii) \quad P_m = .115167713T_n^2 - .166137107T_e^2 - 2.814618155T_n + 4.417628573T_e + 37.105207424$$

$$\begin{aligned} \text{Reg. S.S.} &= (.115167713)(7187815) - (.166137107)(2980010) \\ &\quad - (2.814618155)(353445) + (4.417628573)(227242) \\ &\quad + (37.105207424)(18888) - C.F. \\ &= 29102.26 \end{aligned}$$

$$(iii) \quad P_m = .074245169T_n^2 - 1.308775540T_n + .409397106T_e + 46.406651224$$

$$\begin{aligned} \text{Reg. S.S.} &= (.074245169)(7187815) - (1.308775540)(353445) \\ &\quad + (.409397106)(227242) + (46.406651224)(18888) - C.F. \\ &= 27128.50 \end{aligned}$$

$$(iv) \quad P_m = .432427996T_e + 1.394610368T_n + 23.669179953$$

$$\begin{aligned} \text{Reg. S.S.} &= (.432427996)(227242) + (1.394610368)(353445) \\ &\quad + (23.669179953)(18888) - C.F. \\ &= 24734.43 \end{aligned}$$

$$(v) \quad P_m = 1.485060385T_e + 36.331980110$$

$$\begin{aligned} \text{Reg. S.S.} &= (1.485060385)(227242) + (36.331980110)(18888) - C.F. \\ &= 10193.62 \end{aligned}$$