

1.

解釋名詞：10 分（每小題 5 分）

- (1) 統計量.
- (2) 不偏估計量.

2.

簡答題：12 分（每小題 6 分）

- (1) 試說明變異與變異數有何異同？
- (2) 試說明估計量與估計值有何異同

註：下列計算提均需寫出計算過程始計分

3. (18 分)

試求下列機率分配之近似 (1) 第 15 百分位數 (2) 第一四分位數 (3) 中位數

- (a)  $X \sim N(90, 10^2)$  (9 分) (b)  $X \sim U(0, 2)$  (9 分)

4. (18 分)

設甲、乙兩區之居民兩個獨立之常態分配。今若甲區之居民有  $7/8$  之所得高於 60 萬元，乙區之居民有  $1/10$  低於 60 萬，且甲、乙兩區居民分別有  $3/4$  及  $4/5$  所得低於 80 萬。試求：

- (1) 甲、乙兩區居民之各平均所得及標準差為何？(12 分)
- (2) 由甲、乙兩區各抽一位居民，此兩居民所得之差大於 5 萬之近似機率為何？(6 分)

5. (20 分)

若檢定  $H_0: \mu \leq 150$ ;  $H_1: \mu > 150$ ,  $\sigma = 20$ ,  $n = 100$ ,  $\alpha = 0.05$ , 則

- (1) 試寫出決策法則為何？(5 分)
- (2) 當真實的母體平均數為 152，接受  $H_1$  之近似機率為何？(5 分)
- (3) 今設樣本平均數為 151，則說明您的結論為何？(5 分)
- (4) 試求 (3) 中之 P-值為何？並以此 P-做結論

6. (22 分)

為研究某一區男、女所得問題，在該地區隨機取 10 對男、女作為樣本，並列於下表：(單位：千元)

女所得	25	25	25	30	30	30	35	35	35	35
男所得	30	35	35	30	35	35	40	35	35	40

試依上表之樣本求出

- (1) 男、女所得之聯合機率分配表與邊際機率分配 (6 分)
- (2) 男、女所得之相關係數 (12 分)
- (3) 若女之所得為 30 時，男之所得之條件機率分配，並求其條件期望值 (4 分)

表 4 標準常態分配值



$z$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
-3.5	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
-3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
-3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
-3.2	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
-3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
-3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
-2.9	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
-2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
-2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
-2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
-2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
-2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
-2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
-2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
-2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
-2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
-1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
-1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
-1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
-1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
-1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
-1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
-1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
-1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
-1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
-1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
-0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
-0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
-0.7	.2420	.2389	.2358	.2327	.2297	.2266	.2236	.2206	.2177	.2148
-0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
-0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
-0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
-0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
-0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
-0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
-0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641