

類 科：教育行政

科 目：教育測驗與統計概要

考試時間：1 小時 30 分

座號：\_\_\_\_\_

※注意：(一)可以使用電子計算器。

(二)不必抄題，作答時請將試題題號及答案依照順序寫在試卷上，於本試題上作答者，不予計分。

一、請闡述實作評量的特性。(25 分)

二、收集構念效度證據常用的方法有那幾種？試以「數學推理評量」為例，簡要說明之。(25 分)

三、已知一變數  $X$  成偏態分配，其平均數為 20，標準差為 5。(附常態分配表)

(一)從此分配抽取 8 個分數並計算其平均數，若重複此步驟無限多次，則這些樣本平均數所形成的分配之平均數為何？(5 分)

(二)從此分配只抽取 5 個分數並計算其平均數，再重複此步驟無限多次之後，這些樣本平均數所形成的分配之變異誤為何？(5 分)

(三)若從同一個分配抽取 100 個分數並計算其平均數，重複此步驟無限多次之後，可以得到一個由樣本平均數所形成的分配。在這個分配中，樣本平均數小於 20.98 的概率為何？(10 分)

四、下面左表為學生在數學推理及語文推理上的成績，右表為數學推理的部分成績。請根據數據回答問題，列出算式並解釋結果(未列出算式者，不予計分)。(附常態分配表)

|     | 數學推理 | 語文推理 |
|-----|------|------|
| 人數  | 100  | 100  |
| 平均數 | 48   | 60   |
| 標準差 | 8    | 10   |
| 中數  | 49   | 58   |
| 眾數  | 50   | 56   |

數學推理部分成績

| 原始分數 | 次數 | 累積次數 |
|------|----|------|
| ...  |    |      |
| 55   | 3  | 80   |
| 54   | 4  | 77   |
| 53   | 2  | 74   |
| ...  |    |      |

(一) A 生的數學推理與語文推理成績同為 54 分，A 生在那一個測驗上的表現較好？(5 分)

(二)承上題，A 生數學推理的 PR 值是多少？請解釋其表現。(5 分)

(三)若 B、C、D、E 四人在數學推理測驗上的 PR 值分別為 10、20、50、60，則 B、C 原始分數的差異是否與 D、E 原始分數的差異相同？(5 分)

(四)教師將數學推理測驗的原始分數做常態化轉換，形成 L 量尺分數，設定其分配之平均數為 80、標準差為 10。A 生的數學推理 L 量尺分數是多少？(5 分)

(五)數學推理測驗分數最低 10% 的學生需要補救教學。教師該設定補救教學的 L 量尺截點分數是多少？(5 分)

(六)數學資優生在數學推理測驗上的最低標準是 L 量尺分數 100 分。全校 1000 名學生中有多少位是資優生？(5 分)

(請接第二頁)

101年公務人員普通考試試題

代號：41060

類 科：教育行政  
科 目：教育測驗與統計概要

常態分配表

| z   | 概 率   | y     | z    | 概 率   | y     | z    | 概 率   | y     | z    | 概 率   | y     | z    | 概 率   | y     |
|-----|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|
| .00 | .0000 | .3989 | .50  | .1915 | .3521 | 1.00 | .3413 | .2420 | 1.50 | .4332 | .1295 | 2.00 | .4772 | .0540 |
| .01 | .0040 | .3989 | .51  | .1950 | .3503 | 1.01 | .3438 | .2366 | 1.51 | .4345 | .1276 | 2.01 | .4778 | .0529 |
| .02 | .0080 | .3989 | .52  | .1985 | .3485 | 1.02 | .3461 | .2371 | 1.52 | .4357 | .1257 | 2.02 | .4783 | .0519 |
| .03 | .0120 | .3988 | .53  | .2019 | .3467 | 1.03 | .3485 | .2374 | 1.53 | .4370 | .1238 | 2.03 | .4788 | .0508 |
| .04 | .0160 | .3986 | .54  | .2054 | .3448 | 1.04 | .3508 | .2373 | 1.54 | .4382 | .1219 | 2.04 | .4793 | .0498 |
| .05 | .0199 | .3984 | .55  | .2088 | .3429 | 1.05 | .3531 | .2323 | 1.55 | .4394 | .1200 | 2.05 | .4798 | .0488 |
| .06 | .0239 | .3982 | .56  | .2123 | .3410 | 1.06 | .3554 | .2299 | 1.56 | .4406 | .1182 | 2.06 | .4803 | .0478 |
| .07 | .0279 | .3980 | .57  | .2157 | .3391 | 1.07 | .3577 | .2275 | 1.57 | .4418 | .1163 | 2.07 | .4808 | .0468 |
| .08 | .0319 | .3977 | .58  | .2190 | .3372 | 1.08 | .3599 | .2251 | 1.58 | .4429 | .1145 | 2.08 | .4812 | .0459 |
| .09 | .0359 | .3973 | .59  | .2224 | .3352 | 1.09 | .3621 | .2203 | 1.59 | .4441 | .1127 | 2.09 | .4817 | .0449 |
| .10 | .0398 | .3970 | .60  | .2257 | .3332 | 1.10 | .3643 | .2179 | 1.60 | .4452 | .1109 | 2.10 | .4821 | .0440 |
| .11 | .0438 | .3965 | .61  | .2291 | .3312 | 1.11 | .3665 | .2155 | 1.61 | .4463 | .1092 | 2.11 | .4826 | .0431 |
| .12 | .0478 | .3961 | .62  | .2324 | .3292 | 1.12 | .3686 | .2131 | 1.62 | .4474 | .1074 | 2.12 | .4830 | .0422 |
| .13 | .0517 | .3956 | .63  | .2357 | .3271 | 1.13 | .3708 | .2107 | 1.63 | .4484 | .1057 | 2.13 | .4834 | .0413 |
| .14 | .0557 | .3951 | .64  | .2389 | .3251 | 1.14 | .3729 | .2083 | 1.64 | .4495 | .1040 | 2.14 | .4838 | .0404 |
| .15 | .0596 | .3945 | .65  | .2422 | .3230 | 1.15 | .3749 | .2059 | 1.65 | .4505 | .1023 | 2.15 | .4842 | .0396 |
| .16 | .0636 | .3939 | .66  | .2454 | .3209 | 1.16 | .3770 | .2036 | 1.66 | .4515 | .1006 | 2.16 | .4846 | .0387 |
| .17 | .0675 | .3932 | .67  | .2486 | .3187 | 1.17 | .3790 | .2012 | 1.67 | .4525 | .0989 | 2.17 | .4850 | .0379 |
| .18 | .0714 | .3925 | .68  | .2517 | .3166 | 1.18 | .3810 | .1989 | 1.68 | .4535 | .0973 | 2.18 | .4854 | .0371 |
| .19 | .0753 | .3918 | .69  | .2549 | .3144 | 1.19 | .3830 | .1965 | 1.69 | .4545 | .0957 | 2.19 | .4857 | .0363 |
| .20 | .0793 | .3910 | .70  | .2580 | .3123 | 1.20 | .3849 | .1942 | 1.70 | .4554 | .0940 | 2.20 | .4861 | .0355 |
| .21 | .0832 | .3902 | .71  | .2611 | .3101 | 1.21 | .3869 | .1919 | 1.71 | .4564 | .0925 | 2.21 | .4864 | .0347 |
| .22 | .0871 | .3894 | .72  | .2642 | .3079 | 1.22 | .3888 | .1895 | 1.72 | .4573 | .0909 | 2.22 | .4868 | .0339 |
| .23 | .0910 | .3885 | .73  | .2673 | .3056 | 1.23 | .3907 | .1872 | 1.73 | .4582 | .0893 | 2.23 | .4871 | .0332 |
| .24 | .0948 | .3876 | .74  | .2704 | .3034 | 1.24 | .3925 | .1849 | 1.74 | .4591 | .0878 | 2.24 | .4875 | .0325 |
| .25 | .0987 | .3867 | .75  | .2734 | .3011 | 1.25 | .3944 | .1826 | 1.75 | .4599 | .0863 | 2.25 | .4878 | .0317 |
| .26 | .1026 | .3857 | .76  | .2764 | .2989 | 1.26 | .3962 | .1804 | 1.76 | .4608 | .0848 | 2.26 | .4881 | .0310 |
| .27 | .1064 | .3847 | .77  | .2794 | .2966 | 1.27 | .3980 | .1781 | 1.77 | .4616 | .0833 | 2.27 | .4884 | .0303 |
| .28 | .1103 | .3836 | .78  | .2823 | .2943 | 1.28 | .3997 | .1758 | 1.78 | .4625 | .0818 | 2.28 | .4887 | .0297 |
| .29 | .1141 | .3825 | .79  | .2852 | .2920 | 1.29 | .4015 | .1736 | 1.79 | .4633 | .0804 | 2.29 | .4890 | .0290 |
| .30 | .1179 | .3814 | .80  | .2881 | .2897 | 1.30 | .4032 | .1714 | 1.80 | .4641 | .0790 | 2.30 | .4893 | .0283 |
| .31 | .1217 | .3802 | .81  | .2910 | .2874 | 1.31 | .4049 | .1691 | 1.81 | .4649 | .0775 | 2.31 | .4896 | .0277 |
| .32 | .1255 | .3790 | .82  | .2939 | .2850 | 1.32 | .4066 | .1669 | 1.82 | .4656 | .0761 | 2.32 | .4898 | .0270 |
| .33 | .1293 | .3778 | .83  | .2967 | .2827 | 1.33 | .4082 | .1647 | 1.83 | .4664 | .0748 | 2.33 | .4901 | .0264 |
| .34 | .1331 | .3765 | .84  | .2995 | .2803 | 1.34 | .4099 | .1626 | 1.84 | .4671 | .0734 | 2.34 | .4904 | .0258 |
| .35 | .1368 | .3752 | .85  | .3023 | .2780 | 1.35 | .4115 | .1604 | 1.85 | .4678 | .0721 | 2.35 | .4906 | .0252 |
| .36 | .1406 | .3739 | .86  | .3051 | .2756 | 1.36 | .4131 | .1582 | 1.86 | .4686 | .0707 | 2.36 | .4909 | .0246 |
| .37 | .1443 | .3725 | .87  | .3078 | .2732 | 1.37 | .4147 | .1561 | 1.87 | .4693 | .0694 | 2.37 | .4911 | .0241 |
| .38 | .1480 | .3712 | .88  | .3106 | .2709 | 1.38 | .4162 | .1539 | 1.88 | .4699 | .0681 | 2.38 | .4913 | .0235 |
| .39 | .1517 | .3697 | .89  | .3133 | .2685 | 1.39 | .4177 | .1518 | 1.89 | .4706 | .0669 | 2.39 | .4916 | .0229 |
| .40 | .1555 | .3683 | .90  | .3159 | .2661 | 1.40 | .4192 | .1497 | 1.90 | .4713 | .0656 | 2.40 | .4918 | .0224 |
| .41 | .1591 | .3668 | .91  | .3186 | .2637 | 1.41 | .4207 | .1476 | 1.91 | .4719 | .0644 | 2.41 | .4920 | .0219 |
| .42 | .1628 | .3653 | .92  | .3212 | .2613 | 1.42 | .4222 | .1456 | 1.92 | .4726 | .0632 | 2.42 | .4922 | .0213 |
| .43 | .1664 | .3637 | .93  | .3238 | .2589 | 1.43 | .4236 | .1435 | 1.93 | .4732 | .0620 | 2.43 | .4925 | .0208 |
| .44 | .1700 | .3621 | .94  | .3264 | .2565 | 1.44 | .4251 | .1415 | 1.94 | .4738 | .0608 | 2.44 | .4927 | .0203 |
| .45 | .1736 | .3605 | .95  | .3289 | .2541 | 1.45 | .4265 | .1394 | 1.95 | .4744 | .0596 | 2.45 | .4929 | .0198 |
| .46 | .1772 | .3589 | .96  | .3315 | .2516 | 1.46 | .4279 | .1374 | 1.96 | .4750 | .0584 | 2.46 | .4931 | .0194 |
| .47 | .1808 | .3572 | .97  | .3340 | .2492 | 1.47 | .4292 | .1354 | 1.97 | .4756 | .0573 | 2.47 | .4932 | .0189 |
| .48 | .1844 | .3555 | .98  | .3365 | .2468 | 1.48 | .4306 | .1334 | 1.98 | .4761 | .0562 | 2.48 | .4934 | .0184 |
| .49 | .1879 | .3538 | .99  | .3389 | .2444 | 1.49 | .4319 | .1315 | 1.99 | .4767 | .0551 | 2.49 | .4936 | .0180 |
| .50 | .1915 | .3521 | 1.00 | .3413 | .2420 | 1.50 | .4332 | .1295 | 2.00 | .4772 | .0540 | 2.50 | .4938 | .0175 |

(續)

(續)

| z    | 概 率   | y     | z    | 概 率   | y     | z    | 概 率   | y     |
|------|-------|-------|------|-------|-------|------|-------|-------|
| 3.00 | .4987 | .0044 | 3.40 | .4997 | .0012 | 3.80 | .4993 | .0003 |
| 3.01 | .4987 | .0043 | 3.41 | .4997 | .0012 | 3.81 | .4993 | .0003 |
| 3.02 | .4987 | .0042 | 3.42 | .4997 | .0012 | 3.82 | .4993 | .0003 |
| 3.03 | .4986 | .0040 | 3.43 | .4997 | .0011 | 3.83 | .4993 | .0003 |
| 3.04 | .4986 | .0039 | 3.44 | .4997 | .0011 | 3.84 | .4993 | .0003 |
| 3.05 | .4986 | .0038 | 3.45 | .4997 | .0010 | 3.85 | .4993 | .0002 |
| 3.06 | .4985 | .0037 | 3.46 | .4997 | .0010 | 3.86 | .4993 | .0002 |
| 3.07 | .4985 | .0036 | 3.47 | .4997 | .0010 | 3.87 | .4993 | .0002 |
| 3.08 | .4984 | .0035 | 3.48 | .4997 | .0009 | 3.88 | .4993 | .0002 |
| 3.09 | .4984 | .0034 | 3.49 | .4997 | .0009 | 3.89 | .4993 | .0002 |
| 3.10 | .4984 | .0033 | 3.50 | .4998 | .0009 | 3.90 | .4993 | .0002 |
| 3.11 | .4984 | .0032 | 3.51 | .4998 | .0008 | 3.91 | .4993 | .0002 |
| 3.12 | .4984 | .0031 | 3.52 | .4998 | .0008 | 3.92 | .4993 | .0002 |
| 3.13 | .4984 | .0030 | 3.53 | .4998 | .0008 | 3.93 | .4993 | .0002 |
| 3.14 | .4982 | .0029 | 3.54 | .4998 | .0008 | 3.94 | .4993 | .0002 |
| 3.15 | .4982 | .0028 | 3.55 | .4998 | .0007 | 3.95 | .4993 | .0002 |
| 3.16 | .4982 | .0027 | 3.56 | .4998 | .0007 | 3.96 | .4993 | .0002 |
| 3.17 | .4982 | .0026 | 3.57 | .4998 | .0007 | 3.97 | .4993 | .0002 |
| 3.18 | .4983 | .0025 | 3.58 | .4998 | .0007 | 3.98 | .4997 | .0001 |
| 3.19 | .4983 | .0025 | 3.59 | .4998 | .0006 | 3.99 | .4997 | .0001 |
| 3.20 | .4983 | .0024 | 3.60 | .4998 | .0006 | 4.00 | .4997 | .0001 |
| 3.21 | .4983 | .0023 | 3.61 | .4998 | .0006 | 4.05 | .4997 | .0001 |
| 3.22 | .4984 | .0022 | 3.62 | .4999 | .0006 | 4.10 | .4998 | .0009 |
| 3.23 | .4984 | .0022 | 3.63 | .4999 | .0005 | 4.20 | .4999 | .0006 |
| 3.24 | .4984 | .0021 | 3.64 | .4999 | .0005 | 4.30 | .4999 | .0004 |
| 3.25 | .4984 | .0020 | 3.65 | .4999 | .0005 | 4.40 | .4999 | .0002 |
| 3.26 | .4984 | .0020 | 3.66 | .4999 | .0005 | 4.50 | .4999 | .0002 |
| 3.27 | .4985 | .0019 | 3.67 | .4999 | .0005 | 4.60 | .4999 | .0001 |
| 3.28 | .4985 | .0018 | 3.68 | .4999 | .0005 | 4.70 | .4999 | .0000 |
| 3.29 | .4985 | .0018 | 3.69 | .4999 | .0004 | 4.80 | .4999 | .0000 |
| 3.30 | .4985 | .0017 | 3.70 | .4999 | .0004 | 4.90 | .4999 | .0000 |
| 3.31 | .4985 | .0017 | 3.71 | .4999 | .0004 | 5.00 | .4999 | .0000 |
| 3.32 | .4985 | .0016 | 3.72 | .4999 | .0004 |      |       |       |
| 3.33 | .4986 | .0015 | 3.73 | .4999 | .0004 |      |       |       |
| 3.34 | .4986 | .0015 | 3.74 | .4999 | .0004 |      |       |       |
| 3.35 | .4986 | .0015 | 3.75 | .4999 | .0004 |      |       |       |
| 3.36 | .4986 | .0014 | 3.76 | .4999 | .0003 |      |       |       |
| 3.37 | .4986 | .0014 | 3.77 | .4999 | .0003 |      |       |       |
| 3.38 | .4986 | .0013 | 3.78 | .4999 | .0003 |      |       |       |
| 3.39 | .4987 | .0013 | 3.79 | .4999 | .0003 |      |       |       |