



Please mark all your answers on the answer sheet provided to you. Only the answer sheet will be graded. Choose the best answer for each of the following questions. Good Luck

If the weight of 8000 men follows a normal distribution with mean 67 kg. and standard deviation 10 kg. Answer questions (1 - 5)

1- A man was selected randomly. Find the probability that his weight is less than 62 kg.

- A) 0.9525                      B) 0.3085                      C) 0.0475                      D) 0.6915

2- If another man was selected at random, find the probability that his weight is between 60 and 80 kg.

- A) -0.6612                      B) 0.9032                      C) 0.2420                      D) 0.6612

3- If a sample of 36 men was selected, find the probability that the mean of the sample will be more than 71 kg.

- A) 0.0082                      B) 0.3446                      C) 0.9918                      D) 0.6554

4- How many men their weight are less than 60 kg.

- A) 774                              B) 7226                              C) 6064                              D) 1936

5- What is the percentage of men that their weight are less than 80 kg.

- A) 75.8 %                      B) 24.2 %                      C) 90.32 %                      D) 9.68 %

6- The normal distribution curve is .....

- A) discrete                      B) continuous                      C) left skewed                      D) right skewed

7- The total area under the normal distribution curve is equal to .....

- A) +1                              B) +0.5                              C) -1                              D) -0.5

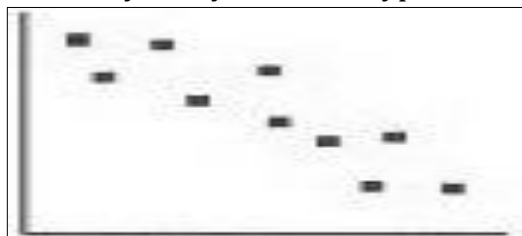
8- In the binomial experiment, the trials must be ..... from each other.

- A) unimodal                      B) dependent                      C) fixed                      D) independent

9- If the scores of three courses for a student, who studied at King Abdulaziz University, are 87, 73, 95, with credit hours are 4, 2, 3, find the mean of the student's scores from 100

- A) 3.05                              B) 85                              C) 86.56                              D) 5.03

10- From the scatter plot below, what can you say about the type of the relationship between  $X$  and  $Y$ ?



- A) Positive linear                      B) Negative linear                      C) No relationship                      D) Curvilinear

If the numbers of sold phones for a store in the past six days are: 3, 6, 4, 9, 3, 8

Answer questions (11 – 22)

11- Find the mean,  $\bar{X}$

- A) 3                                      B) 5                                      C) 6                                      D) 5.5

12- find the median,  $m$

- A) 5                                      B) 6                                      C) 5.5                                      D) 3

13- Find the mode.

- A) no mode                                      B) 3                                      C) 3, 6                                      D) 3, 4, 6

14- The data set is said to be .....

- A) no mode                                      B) a multimodal                                      C) a bimodal                                      D) an unimodal

15- Find the midrange,  $MR$

- A) 5.5                                      B) 6                                      C) 5                                      D) 3

16- Find the range,  $R$

- A) 5                                      B) 12                                      C) 3                                      D) 6

17- Find the variance,  $S^2$

- A) 6.7                                      B) 3.45                                      C) 2.59                                      D) 7.3

18- Find the standard deviation,  $S$

- A) 3.45                                      B) 2.59                                      C) 7.3                                      D) 6.7

19- Find the coefficient of variation,  $CVar$

- A) 212.48 %                                      B) 52.94 %                                      C) 47.09 %                                      D) 112.48 %

20- Find the first quartile,  $Q_1$ .

- A) 5                                      B) 3                                      C) 8                                      D) 6

21- Find the interquartile range,  $IQR$ .

- A) 8                                      B) -5                                      C) 3                                      D) 5

22- Find an outlier if any.

- A) no outliers                                      B) 3                                      C) -4.5                                      D) 9

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23- If  $X = 19$ ,  $\bar{X} = 21$ ,  $S^2 = 9$ , then find the z-score,  $Z$

- A) 1.67                                      B) 0.22                                      C) -0.67                                      D) -1.22
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A survey from King Abdulaziz University found that 23% of patients are smoker. If 7 patients were selected at random, answer questions (24 – 29)

24- Find the probability that 3 of the patients are smoker.

- A) 0.946                      B) 0.203                      C) 0.150                      D) 0.054

25- Find the probability that less than 2 patients are smoker.

- A) 0.496                      B) 0.301                      C) 0.797                      D) 0.203

26- Find the probability that at most 2 of the patients are smoker.

- A) 0.203                      B) 0.496                      C) 0.301                      D) 0.797

27- Find the mean of number of the patients who are smoker.

- A) 1.24                      B) 1.61                      C) 1.11                      D) 1.98

28- Find the variance of number of the patients who are smoker.

- A) 1.61                      B) 1.11                      C) 1.98                      D) 1.24

29- Find the standard deviation of number of the patients who are smoker

- A) 1.11                      B) 1.98                      C) 1.24                      D) 1.61

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Use the available information to answer questions (30 – 33):

$$n = 6, \sum X = 33, \sum Y = 341, \sum XY = 1995, \sum X^2 = 229, \sum Y^2 = 23403, b = 2.52, a = 42.97$$

30- Find the Pearson correlation coefficient,  $r_p$ .

- A) -0.73                      B) 0.73                      C) -0.27                      D) 0.27

31- The value of the correlation coefficient obtained in previous question can be interpreted as follows: There is a ..... linear relationship between the variables  $X$  and  $Y$ .

- A) weak negative                      B) strong positive                      C) weak positive                      D) strong negative

32- Find the equation of the regression line.

- A)  $y' = 42.97 + 2.52x$                       B)  $y' = 2.52 + 42.97x$                       C)  $y' = 42.97 - 2.52x$                       D)  $y' = 2.52 - 42.97x$

33- Predict the value of  $Y$  when  $X = 4$

- A) 32.89                      B) 53.05                      C) -169.36                      D) 174.4

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If a single die is rolled, answer questions (34 – 36)

34- Find the probability of getting an odd number or a number can be divided by 3.

- A) 0.833                      B) 0.333                      C) 0.500                      D) 0.667

35- Find the probability of getting a number less than 2 or can be divided by 3.

- A) 0.667                      B) 0.500                      C) 0.833                      D) 0.333

36- Find the probability of getting number 5.

- A) 0.333                      B) 0.167                      C) 0.667                      D) 0.833

If a random variable  $X$  has the discrete probability distribution as shown below, then answer questions (37 - 40)

$X$	1	2	3	4	5	6
$P(X)$	0.17	0.03	k	0.39	0.14	0.01

37- Find the missing probability,  $k$ .

- A) 3.33                      B) 1.28                      C) 1.64                      D) 0.26

38- Find the mean of the distribution,  $\mu$ .

- A) 1.28                      B) 0.26                      C) 3.33                      D) 1.64

39- Find the variance of the distribution,  $\sigma^2$ .

- A) 1.64                      B) 3.33                      C) 0.26                      D) 1.28

40- Find the standard deviation of the distribution,  $\sigma$

- A) 0.26                      B) 1.64                      C) 1.28                      D) 3.33

## Formulas:

$$\text{Percentage: } p = \frac{f}{\Sigma f} * 100$$

$$\text{Degree: } D = \frac{f}{\Sigma f} * 360$$

$$\text{Mean: } \bar{x} = \frac{\Sigma x}{n}$$

$$\text{Midrange: } MR = \frac{\text{min} + \text{max}}{2}$$

$$\text{Weighted mean: } \bar{x}_w = \frac{\Sigma xw}{\Sigma w}$$

$$\text{Range: } R = \text{max} - \text{min}$$

$$\text{Variance: } s^2 = \frac{\Sigma x^2 - \left(\frac{(\Sigma x)^2}{n}\right)}{n-1}$$

$$\text{Standard deviation: } s = \sqrt{s^2}$$

$$\text{Coefficient of variations: } CVar(x) = \frac{s}{\bar{x}} * 100$$

$$\text{z-score: } z = \frac{x - \bar{x}}{s}$$

$$\text{Interquartile Range: } IQR = Q_3 - Q_1$$

$$\text{Non-outliers interval: } [Q_1 - (1.5)(IQR), Q_3 + (1.5)(IQR)]$$

$$\text{Pearson linear correlation coefficient: } r_p = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[n(\Sigma x^2) - (\Sigma x)^2][n(\Sigma y^2) - (\Sigma y)^2]}}$$

$$\text{Spearman rank correlation coefficient: } r_s = 1 - \frac{6 \Sigma d^2}{n(n^2 - 1)}$$

$$\text{Equation of regression line: } y' = a + bx$$

$$\text{y intercept of the regression line: } a = \frac{(\Sigma y) - (b)(\Sigma x)}{n}$$

$$\text{Slope of the regression line: } b = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{n(\Sigma x^2) - (\Sigma x)^2}$$

Classical probability:  $P(E) = \frac{n(E)}{n(S)}$

Empirical probability:  $P(E) = \frac{f}{n}$

Rule for complementary events:  $P(E) + P(\bar{E}) = 1$

Probability of mutually exclusive:  $P(A \text{ or } B) = P(A) + P(B)$

Probability of not mutually exclusive:  $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

Probability of independent:  $P(A \text{ and } B) = P(A) * P(B)$

Mean of a probability distribution:  $\mu = \sum X P(X)$

Variance of a probability distribution:  $\sigma^2 = \sum X^2 P(X) - \mu^2$

Standard deviation of a probability distribution:  $\sigma = \sqrt{\sigma^2}$

Binomial distribution:

Probability:  $P(X) = {}_n C_x p^x q^{n-x}$

Mean:  $\mu = n p$

Variance:  $\sigma^2 = n p q$

Standard deviation:  $\sigma = \sqrt{n p q}$

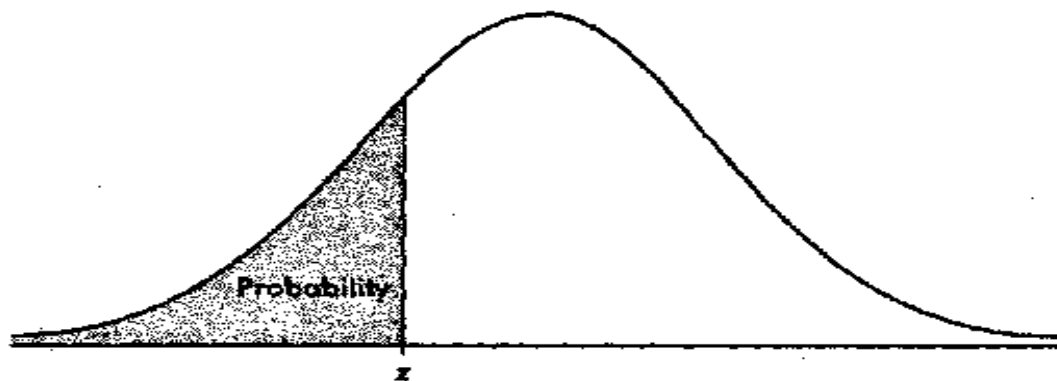
Z-value:  $Z = \frac{X - \mu}{\sigma}$

Z-value:  $Z = \frac{\bar{X} - \mu}{\sigma/\sqrt{n}}$

$P(Z < a) = P(Z \leq a)$

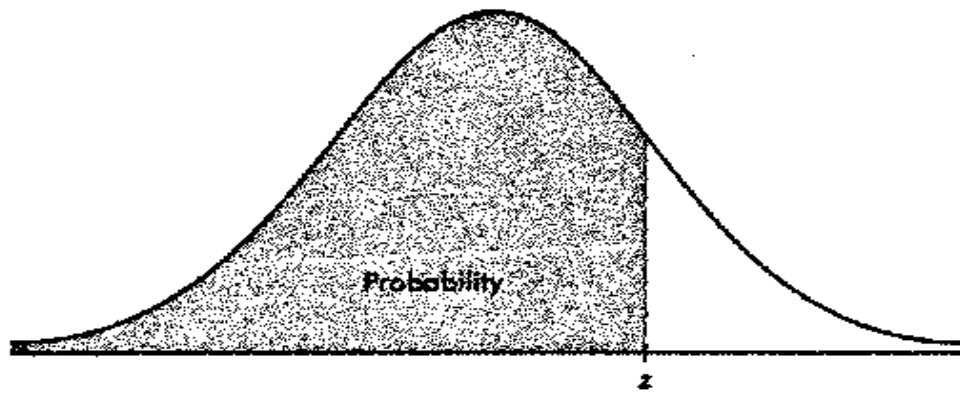
$P(Z > a) = P(Z \geq a) = 1 - P(Z < a)$

$P(a < Z < b) = P(a \leq Z \leq b) = P(Z < b) - P(Z < a)$



**TABLE A: STANDARD NORMAL PROBABILITIES**

<i>z</i>	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
-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	.2296	.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
-0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641



**TABLE A: STANDARD NORMAL PROBABILITIES (CONTINUED)**

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998







# Answer Key Form A

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