جامعة الملك سعود — الاختبار الفصلي الثاني

كلية العلوم — الفصل الثاني 1429 / 1430

قسم الإحصاء وبحوث العمليات — مقرر 145 أحص

الأحد: 14/ 6 / 1430 هـ — الساعة 12 –1

اسم الطالبة : ----------

رقم الطالبة : ----------

رقم الشعبة : ----------رقم التسلسل : ----------

أستاذة المقرر : ----------

Question	1	2	3	4	5	6	7	8	9	10
Answer										

Question	11	12	13	14	15	16	17	18	19	20
Answer										

Question	21	22	23	24	25	26	27
Answer							

Good luck

Answer the following questions

Question (1):

A medical research team wished to evaluate the effectiveness (فعالية) of a proposed test in diagnosing a particular disease. This test was given to a random sample of 600 patients having the disease and another independent random sample of 800 patients without symptoms of the disease. The results are as follows

Diagnosis / Test Result	Yes (D)	No ($\overline{D}$)	Total
Positive (T)	550	60	610
Negative ($\overline{T}$)	50	740	790
Total	600	800	1400

1- What is a false positive?
(a) Test indicates a negative result while the person does not have the disease
(b) Test indicates a positive result while the person has the disease
(c) Test indicates a positive result while the person does not have the disease
(d) Test indicates a negative result while the person has the disease
(e) None of these

2- The sensitivity of the test is
(a) 0.917 (b) 0.902 (c) 0.925 (d)0.937 (e) none of these

3- The specifity of the test is

(a) 0.917 (b) 0.902 (c) 0.925 (d)0.937 (e) none of these

4- Suppose that the rate of the disease in the general population is 0.4. Find the predictive value positive of the test.

(a) 0.1093 (b) 0.3668 (c) 0.9435 (d) 0.8907 (e) none of these

Question (2):

In a large population of population of people, 32% have health problems. If we randomly choose 6 persons. Let X= the number in the 6 chosen that have health problems, then

5-The probability distribution of X, is

(a) $P(X=x)=\binom{6}{x}(0.32)^x(0.68)^{6-x}$ (b) $P(X=x)=\binom{32}{x}(0.06)^x(0.94)^{32-x}$

(c) $P(X=x)=\binom{6}{x}(0.68)^x(0.32)^{6-x}$ (d) $P(X=x)=(e)^{-32}(32)^x/X!$

e) none of these

6-The possible value of X are

(a) X=1,2,…,6 (b) X=0,1,2,…,6 (c) X=0,1 (d) X=0,1,2,3 (e) none of these

7- The probability that none of the persons has health problems is

(a) 0.0989 (b) 0.9011 (c) 0.0727 (d) 0.3284 (e) none of these

8- The probability that at most one of the persons has health problems is

(a) 0.0408 (b) 0.794 (c) 0.622 (d) 0.378 (e) none of these

9- The expected value of X is

(a) 0.32 (b) 1.92 (c) 1.3056 (d) 1.1426 (e) none of these

10- The variance of X is

(a) 0.32 (b) 1.92 (c) 1.3056 (d) 1.1426 (e) none of these

11- The standard deviation of X is

(a) 0.32 (b) 1.92 (c) 1.3056 (d) 1.1426 (e) none of these

Question (3):

The following table represents the number of times that children got throat infection during winter. Let X= the number of times that children got throat infection during winter . If we randomly choose a child and using the following table. Then

X	P(X=x)
1	0.2
2	0.4
3	0.2
4	0.12
5	0.08

12- $P(X < 3) =$

(a) 0.8 (b) 0.4 (c) 0.92 (d) 0.60 (e) none of these

13- $P(X = 4) =$

(a) 0.08 (b) 0.12 (c) 0.92 (d) 0.35 (e) none of these

14- $P(2 \leq X \leq 4) =$

(a) 0.72 (b) 0.2 (c) 0.32 (d) 0.60 (e) none of these

Question (4):

At a certain clinic in Gedah , X= the number of patients with side effects after taking a certain medicine for a week has a Poisson (2.1) distribution. Then

15- The probability that three patients with side effects after taking a certain medicine for a week is

(a)2.1 (b) 0.1890 (c) 12.604 (d) 0.3780 (e) none of these

16- The probability that more than two patients with side effects after taking a certain medicine for a week is

(a) 2.1 (b) 0.6496 (c) 0.3504 (d) 0.3796 (e) none of these

17- The expected number of patients with side effects after taking a certain medicine for a week is

(a) 2.1 (b) 1.449 (c) 5.6 (d) 2.3664 (e) none of these

18- The standard deviation of patients with side effects after taking a certain medicine for a week is

(a) 2.1 (b) 1.449 (c) 5.6 (d) 2.3664 (e) none of these

19- The variance of patients with side effects after taken a certain medicine for a week is

(a) 2.1 (b) 1.449 (c) 5.6 (d) 2.3664 (e) none of these

20- The parameters of binomial distribution are

(a) λ (b) n, p (c)n, q (d) μ, σ (e) none of these

Question (5):

If Z has standard normal distribution, then:

21- P(Z=-2.95)=

(a) 0.9984 (b) 0.00016 (c) 0.9968 (d) 0 (e) none of these

22- P(Z< 3)=

(a) 0.0012 (b) 0.9988 (c) 0.9987 (d) 0.0013 (e) none of these

23- P(Z > 2.67)=

(a) 0.9962 (b) 0.0029 (c) 0.9971 (d) 0.0038 (e) none of these

24- P(Z≥ z)= 0.7054 , then z =

(a) 0.54 (b) -0.54 (c) -0.55 (d) 0.545 (e) none of these

25- P(0.95<Z< z)= 0.1629 , then z =

(a) 2.40 (b) 0.41 (c)- 0.9918 (d) -0.99 (e) none of these

26- The mean μ in the normal distribution determines

(a) The location of the distribution.

(b) The peaked ness and the flatness of the curve.

(c) The variability of the distribution.

(d) The scale of the distribution.

(e) There is no effect on the distribution.

27- One of the following is <u>not true</u> about standard normal distribution:

(a) Area under the curve =1 (b) Has variance 0 and mean 1 .
(c) It is symmetric around 0 (d) No effect of different values of mean

(e) It is a continuous distribution.

(End of questions)