

Department of Statistics and Operations Research  
**College of Science**  
King Saud University

Student Name:			
Student Number:		Section Number:	
Teacher Name:		Attendance Number:	

1	2	3	4	5	6	7	8	9	10
A	B	D	A	B	C	A	A	D	A

11	12	13	14	15	16	17	18	19	20
D	A	C	D	B	A	D	C	D	C

21	22	23	24	25
B	B	D	B	A

Marks for the term	
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- » Mobile Telephones are not allowed in the classrooms
- » Time allowed is 1 and 1/2 hours
- » Attempt all questions
- » Choose the nearest number to your answer
- » For each question, put the code of the correct answer in the above table under the question number

----- Questions 1 -----

Suppose the mean and standard deviation of serum iron values for healthy men are  $\mu = 110$  and  $\sigma = 13$  micrograms (mg) per 100 ml. If  $\bar{x}$  is the mean of serum iron of a random sample of size 36 healthy men, then:

- 1) By the central limit theorem the sampling distribution of  $\bar{x}$  is approximately:  
(A) Normal      (B) Binomial      (C) Poisson      (D) none of them
- 2) The mean of the sampling distribution of  $\bar{x}$  is:  
(A) 13 mg      (B) 110 mg      (C) 18.33 mg      (D) 2.17 mg
- 3) The standard error of the sampling distribution of  $\bar{x}$  is:  
(A) 13 mg      (B) 110 mg      (C) 18.33 mg      (D) 2.17 mg
- 4) The probability that  $P(\bar{x} \geq 113)$  is:  
(A) 0.0838      (B) 0.4162      (C) 0.9162      (D) 0.90
- 5) The probability that  $P(107 \leq \bar{x} \leq 113)$  is:  
(A) 0.95      (B) 0.8324      (C) 0.9162      (D) 0.90

----- Questions 2 -----

A research team is interested in the patient visit time in a given hospitals. Suppose the mean of the patient visit times is  $\mu$  minutes. Also, a patient sample of size  $n$  showed the mean  $\bar{x}$  and the standard deviations:  $S$  for the visit times Then:

❖ If we found in case  $n = 49$  that  $S = 4.7$ ,  $\bar{x} = 15.3$  then:

- 6) The point estimate of  $\mu$  is:  
(A) 0.671      (B) 4.7      (C) 15.3      (D) 0.451
- 7) The estimate of standard error of  $\bar{x}$  is:  
(A) 0.671      (B) 4.7      (C) 15.3      (D) 0.451
- 8) The reliability coefficient of 90% confidence interval for  $\mu$  is equal to:  
(A) 1.645      (B) 1.96      (C) 1.28      (D) 2.325
- 9) The 90% confidence interval for  $\mu$  is equal to:  
(A) (13.2, 15.1)      (B) (15.6, 16.4)      (C) (13.6, 20.7)      (D) (14.2, 16.4)
- ❖ If we found in case  $n = 16$  that  $S = 5.2$ ,  $\bar{x} = 14.8$  and under normality, then:
- 10) The 90% confidence interval for  $\mu$  is equal to:  
(A) (12.52, 17.08)      (B) (15.52, 17.08)      (C) (11.52, 14.2)      (D) (13.52, 16.8)

----- Questions 3 -----

Suppose  $P$  is the Diabetic proportion in Dammam is unknown, but a sample of size  $n = 400$  persons showed the sample Diabetic proportion  $\hat{p} = 0.20$ , then:

- 11) The 95% confidence interval for  $P$  is equal to:  
(A) (0.18, 0.195) (B) (0.21, 0.234) (C) (0.178, 0.245) (D) (0.1608, 0.2392)

----- Questions 4 -----

The Diabetic proportion in Riyadh is  $P = 0.15$ , and if 5 random persons were tested and the variable  $Y$  = number of Diabetic persons in the sample, then:

- 12) The probability that exactly one Diabetic person in the sample is:  
(A) 0.3915 (B) 0 (C) 0.2567 (D) 0.2392
- 13) The probability that at least one Diabetic person in the sample is:  
(A) 0.8432 (B) 0.4437 (C) 0.5563 (D) 0.7654
- 14) The mean number of Diabetic persons in the sample is:  
(A) 1 (B) 0.25 (C) 2 (D) 0.75
- 15) The variance number of Diabetic persons in the sample is:  
(A) 1 (B) 0.6375 (C) 2 (D) 0.75

----- Questions 5 -----

The number of traffic accidents that occurs on a particular stretch of road during a month follows a Poisson distribution with a mean of 4.5 accidents.

- 16) The probability that 4 accidents will occur on this stretch of road during a randomly selected month.  
(A) 0.19 (B) 0.075 (C) 0.1872 (D) 0.81
- 17) The probability that at most one accident will occur on this stretch of road during next month.  
(A) 0.3214 (B) 0.05 (C) 0.9389 (D) 0.0611
- 18) The probability that at least 2 accidents will occur on this stretch of road during next month.  
(A) 0.3214 (B) 0.11248 (C) 0.9389 (D) 0.0611
- 19) The mean number of accidents that will occur on this stretch of road during next two months.  
(A) 4.5 (B) 2 (C) 21 (D) 9

----- Questions 6 -----

Suppose it is known that the weights of a certain population of individuals are approximately normal with a mean of 70 kg and a standard deviation of 3 kg. If a person is picked at random from this group, then the probability that the weight of the person will be:

- 20) Between 65 and 74 kgs is:  
(A) 0.9082 (B) 0.0475 (C) 0.8607 (D) 0.34

21) More than 74 kgs is:

- (A) 0.9082      (B) 0.0918      (C) 1.33      (D) non of them

----- Questions 7 -----

Let  $Z$  be a standard normal variable then:

22) The probability that  $Z$  is greater than zero is:

- (A) 0      (B) 0.5      (C) 0.25      (D) -0.5

23) The probability  $P(Z \leq -0.67)$  equals to :

- (A) 0.9082      (B) 0.4376      (C) 0.7486      (D) 0.2514

----- Questions 8 -----

The Diabetic proportion in Riyadh is  $P=0.15$ . Suppose  $\hat{p}$  is the sample Diabetic proportion in a sample of size  $n=300$  persons, then:

24) The standard error of the sampling distribution of  $\hat{p}$  is:

- (A) 0.000425      (B) 0.0206      (C) 0.15      (D) 0.85

25) The probability  $P(\hat{p} < 0.16)$  is:

- (A) 0.6879      (B) 0.7356      (C) 0.3151      (D) 0.5678