## Statistics – Second – Summer Semester – 2021

Q1: Suppose that  $X \sim bin(55,0.2)$ . Using the normal approximation to the binomial distribution, P(10.< X <= 12.) is closest to:

- a. 0.28
- b. 0.26
- c. 0.39
- d. 0.20
- e. 0.33

Q2: Let  $X\sim bin(7,0.52)$ , then P(X=2) is equal to:

- a. 0.289
- b. 0.184
- c. 0.27
- d. 0.145
- e. 0.0689

Q3: Suppose that a screening test diagnoses 90% of sick people positive and 90% of healthy people negative. Assume that 12% of those screened are sick. If a screened person is chosen at random, then the probability of having a positive diagnosis is:

- a. 0.0612
- b. 0.196
- c. 0.551
- d. 0.804
- e. 0.449

Q4: Suppose that 75% of science students, 45% of business students, and 45% of humanities students pass a mathematics course. If 25% of the students in the course are science students, 15% are business students and 60% are humanities students, then the probability that a randomly selected student who has passed the course is a science student is

- a. 0.54
- b. 0.456
- c. 0.417
- d. 0.125
- e. 0.583

Q5: A box has a large number of items which have mean weight 60 gm's and standard deviation 15 gm's. One item was picked at random. If its weight is denoted by X, then P(X>48) is closest to

- a. 0.79
- b. 0.36

- c. 0.50
- d. 0.21
- e. 0.50

Q6: Let  $X \sim Bin(6,0.6)$ , then P(X > 4|X > 3) is

- a. 0.399
- b. 0.663
- c. 0.221
- d. 0.429
- e. 0.7

Q7: A random sample of size 12 is selected from Normal distribution with mean 12 and unknown variance. If the sample standard deviation S is 6, then the (90)th percentile of the sample mean is closest to:

- a. 12.90
- b. 14.40
- c. 9.64
- d. 10.10
- e. 12.40

Q8: The sampling distribution of the sample mean is close to the normal distribution

- a. Regardless the distribution of the parent population or what the value of n
- b. If the standard deviation of the parent population is known
- c. Only if both n is large and the parent population has a normal distribution
- d. If n is large, regardless the distribution of the parent population
- e. Only if the parent population is not skewed and does not have outliers

Q9: Let  $X \sim bin(18,0.7)$ , then  $P(5 \le X < 10)$  is closest to:

- a. 0.14
- b. 0.0595
- c. 0.278
- d. 0.141
- e. 0.0593

Q10: Suppose X is random variable with possible values -2,4 and 2 and with respective probabilities 0.28, 0.48, and 0.24 then  $E(5X-2X^2)$  is:

- a. -10.32
- b. 2.4288
- c. -4.3424
- d. 22.7424
- e. 15.9712

Q11: Suppose X is a random variable with possible values 3, -2 and -3 and with respective probabilities 0.15, 0.48, and 0.37 then the mean and standard deviation of X, respectively, are:

## a. -1.62 and 1.994

- b. -0.667 and 0.9533
- c. -0.667 and 2.21
- d. -1.62 and 2.21
- e. -1.62 and 0.9533

Q12: Suppose that the time in minutes it takes a student to complete on assignment is normally distributed with a mean 50 and variance 100 then the 85<sup>th</sup> percentile of the average time it takes a random sample of 25 students to complete the assignment is closest to

- a. 60
- b. 52
- c. 40
- d. 71
- e. 48

Q13: Suppose X is a random variable with possible values -2,3 and 1 and with respective probabilities 0.22, 0.35, and 0.43 then the mean and standard deviation of X, respectively, are:

- a. 1.04 and 0.3733
- b. 1.04 and 1.876
- c. 1.04 and 1.838
- d. 0.667 and 1.876
- e. 0.667 and 0.3733

Q14: Let  $X \sim Bin(5,0.5)$ , then P(X > 3|X > 2) is

- a. 0.188
- b. 0.727
- c. 0.375
- d. 0.381
- e. 0.615

Q15: Let  $X \sim Bin(7,0.5)$ , then P(X > 4|x > 3) is

- a. 0.646
- b. 0.393
- c. 0.227
- d. 0.453
- e. 0.688

Q16: Suppose that the time it takes a student to complete an assignment is normally distributed with mean 60 and variance 100 then the 65<sup>th</sup> percentile of the average time it takes a random sample of 36 students to complete the assignment is closest to

- a. 61
- b. 59
- c. 66
- d. 64
- e. 56

Q17: A box has a large number of items which have mean weight 60 gm's and standard deviation 15 gm's. One item was picked at random. If its weight is denoted by X, then P(X > 57) is closest to

- a. 0.73
- b. 0.58
- c. 0.57
- d. 0.27
- e. 0.42

Q18: Let  $X \sim Bin(5,0.5)$ , then P(X > 3|X > 2) is

- a. 0.188
- b. 0.727
- c. 0.375
- d. 0.381
- e. 0.615

Q19: Suppose that the time in minutes it takes a student to complete on assignment is normally distributed with a mean 50 and variance 100 then the 85<sup>th</sup> percentile of the average time it takes a random sample of 16 students to complete the assignment is closest to

- a. 40
- b. 76
- c. 47
- d. 60
- e. 53

Q20: Suppose that a screening test diagnoses 97% of sick people positive and 95% of healthy people negative. Assume that 7% of those screened are sick. If a screened person is chosen at random, then the probability of having a positive diagnosis is:

- a. 0.0184
- b. 0.594
- c. 0.114
- d. 0.886
- e. 0.406

Q21: Let  $X \sim bin(18,0.6)$ , then  $P(5 \le X < 10)$  is closest to:

- a. 0.431
- b. 0.257

- c. 0.435
- d. 0.262
- e. 0.62

Q22: Suppose that  $X\sim bin(65,0.2)$ . Using the normal approximation to the binomial distribution, P(12.< X <= 14.) is closest to:

- a. 0.24
- b. 0.18
- c. 0.26
- d. 0.30
- e. 0.36

Q23: The central limit theorem says that the sampling distribution of the sample mean is approximately normal

- a. Only if both the sample size is large and the values of the mean and the variance of the parent population are unknown
- b. Only if both the parent population is normal and the mean of the parent population is known
- c. Only if the mean and variance of the parent population are known
- d. If the sample size is large, regardless of the parent population
- e. Only if both the sample size is large and the parent population is normal

Q24: A box has a large number of items which have mean weight 44 gm's and standard deviation 15 gm's. One item was picked at random. If its weight is denoted by X, then P(X > 57) is closest to

- a. 0.87
- b. 0.81
- c. 0.93
- d. 0.07
- e. 0.19

Q25: Let  $X\sim bin(7,0.57)$ , then P(X=2) is equal to:

- a. 0.1
- b. 0.325
- c. 0.234
- d. 0.201
- e. 0.0478

Q26: A random sample of size 23 is selected from Normal distribution with mean 16 and unknown variance. If the sample standard deviation S is 10, then the (95)th percentile of the sample mean is closest to:

- a. 16.80
- b. 13.20

- c. 19.60
- d. 17.40
- e. 12.40

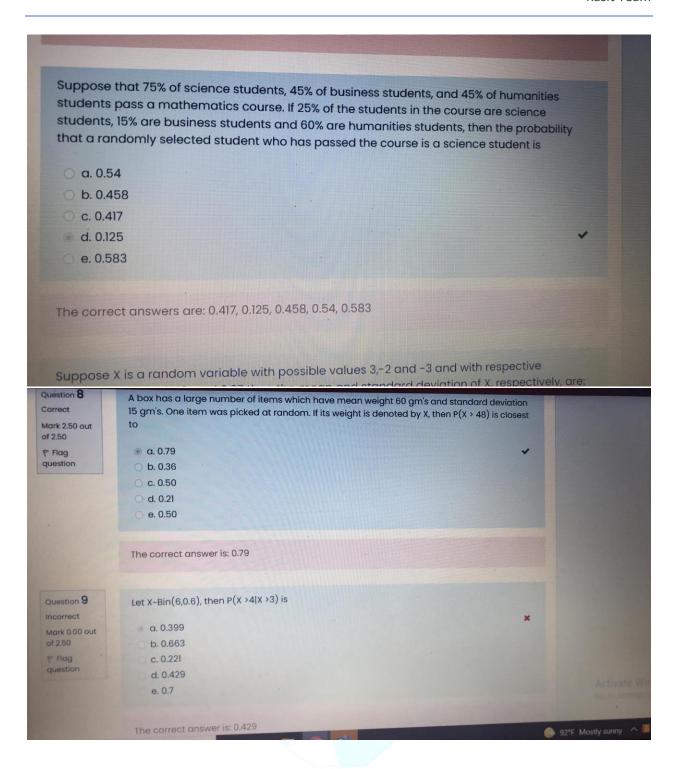
Q27: Suppose X is a random variable with possible values -2,-4 and 2 and with respective probabilities 0.42, 0.48, and 0.1 then  $E(5X-2X^2)$  is:

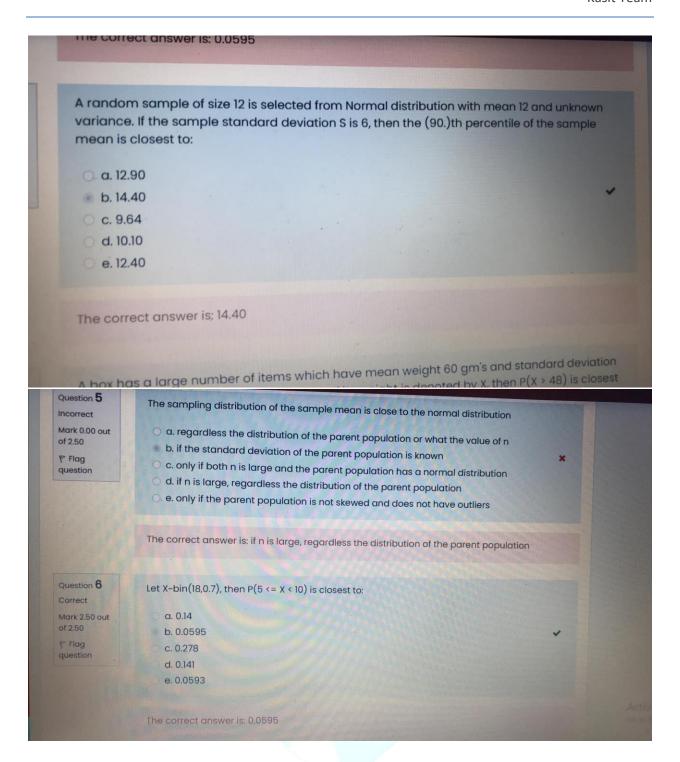
- a. -32.32
- b. 13.4144
- c. 0.3072
- d. -39.0144
- e. -25.9072

Q28: Suppose that 85% of science students, 45% of business students, and 35% of humanities students pass a mathematics course. If 35% of the students in the course are science students, 30% are business students and 35% are humanities students, then the probability that a randomly selected student who has passed the course is a science student is

- a. 0.523
- b. 0.229
- c. 0.477
- d. 0.535
- e. 0.294

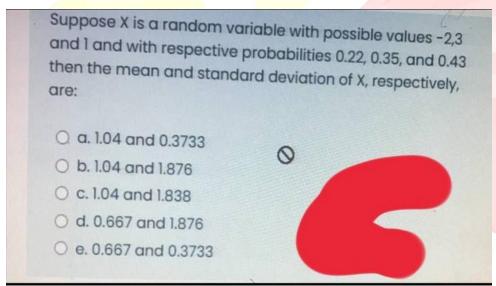
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Incorrect	X <= 12. ) is closest to:	
Mark 0.00 out of 2.50	⊚ a. 0.28	
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question	0 c. 0.39	
	O d. 0.20	
	O e. 0.33	
	The correct answer is: 0.26	
		121 11 13
Question 12	Let X~bin(7,0.52), then P(X=2) is equal to:	
Incorrect	g. 0.289	
Mark 0.00 out of 2.50	b. 0.184	
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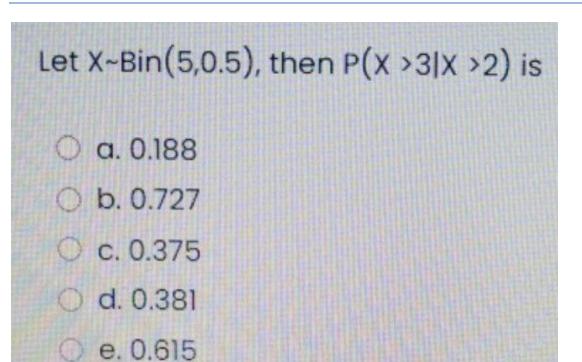




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12.50 out of 30.00 (42%)	
distributed with a mean 50 and varie	takes a student to complete an assignment is normally ance 100 then the 85th percentile of the average time it nts to complete the assignment is closest to
<ul><li>a. 60.</li></ul>	×
O b. 52.	
O c. 40.	
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e. 48.	
The correct answer is: 52.	
Suppose X is a random variable with	h possible values -2,4 and 2 and with respective on E(5X-2X <sup>2</sup> ) is:





Let X~Bin(7,0.5), then P(X >4|X >3) is

a. 0.646
b. 0.393
c. 0.227
d. 0.453
e. 0.688

Suppose that the time it takes a student to complete an assignment is normally distributed with mean 60 and variance 100 then the 65th percentile of the average time it takes a random sample of 36 students to complete the assignment is closest to

- O a. 61.
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A box has a large number of items which have mean weight 60 gm's and standard deviation 15 gm's. One item was picked at random. If its weight is denoted by X, then P(X > 57) is closest to

- a. 0.73
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Let  $X\sim Bin(5,0.5)$ , then P(X>3|X>2) is

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Suppose that the time in minutes it takes a student to complete an assignment is normally distributed with a mean 50 and variance 100 then the 85th percentile of the average time it takes a random sample of 16 students to complete the assignment is closest to	
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Suppose that X-bin(55,0.2). Using the normal approximation to the binomial distribution, P(10.< X <= 12.) is closest to:

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