## FEDERAL PUBLIC SERVICE COMMISSION

# Student Bounty.com COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS IN BPS-17, UNDER THE FEDERAL GOVERNMENT, 2005

## **STATISTICS**

		SIALISTICS
TIN	<u> 1E Al</u>	LOWED: 3 HOURS MAXIMUM MARKS: 100
NO	TE:	Attempt FIVE questions in all, including QUESTION NO. 8 which is COMPULSORY. All question carry equal marks.
1.	a)	Write the applications of probability theory in decision making.  (10)
	b)	A study of credit card fraud was conducted by a crime researcher. According to collected data, it was found that 243 cases were of stolen cards, 85 of counterfeit card, 52 of mail orders and 46 of both stolen card and mail orders. Find the probability that a randomly selected case  (i) belongs to counterfeit card  (ii) belongs to stolen card or mail order fraud
		(10)
2.	a)	According to the Labour Department, 15% of adult workers have a vocational diploma but they did not attend any institution. If 8 adults are randomly selected find the probability that  (i) at least half of them have diploma but they did not attend any institution.
		(ii) there is no such case that the adult has diploma but he did not attend any institution.  (10)
	b)	The serum cholesterol levels in men aged 18-24 are normally distributed with a mean of 178.1 and a standard deviation of 40.7 (all units are in mg/100ml). If a man aged 21 is selected at random, find the probability that his serum cholesterol level is between 100 and 200. Find the probability that for a sample of 10 men aged 21-24 will have average serum cholesterol level greater than 200.
	,	(10)
<b>3.</b> .	a)	Differentiate between  (i) One-tailed test and two-tailed test
		(ii) Interval and point estimation
		(iii) Simple and composite hypotheses
	1.5	(10)
	b)	In an insurance study of pedestrian deaths in a country, monthly fatalities are analyzed for two different time periods. Sample data from the both time periods are summarized by the following statistics:
		$n_1 = 12, \ \vec{x_1} = 46.42, \ s_1 = 11.07; \qquad n_2 = 15, \ \vec{x_2} = 51.06, \ s_2 = 10.39$
		At 0.05 level of significance, test the claim that both time periods have the same mean.
		(10)
4.	a)	What is the difference between a correlation problem and a regression problem? Also give the situation where we have to use partial correlation rather than simple correlation.  (10)
	<b>(b)</b>	Randomly selected subjects ride a bicycle at 5.5mi/h for one minute. Their weights (in pounds) are given with the number of calories used. Find the correlation coefficient between the both quantities.
1		Weights: 167 191 112 129 140 173 119
	7/	Calories used: 4.23 4.69 3.21 3.47 3.72 4.45 3.36
5.	a)	Where do we use Stratified Random Sampling? Write a general procedure to draw a
7/.	u) •	stratified random sample. Also differentiate between stratum and cluster.
<i>-</i>		(10)

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	ject:	STATI	<u>ISTICS</u>		•	GENT	
	b)		0, draw all possible rand		ion? For a population of wir f size 2 without replacement a		
	а)	What are the	e applications of Statistic	s in daily life	problems?	(10)	16
	- b)	variable X re 0 cures, 1	epresents the number of	cures that occ ures are foun	ninistered to 3 patients, and the our. The probabilities correspond to be 0.125, 0.375, 0.375	random nding to	
	Write	short note on	the following:			$\bigcirc \qquad (10) \qquad \qquad \bigcirc \qquad (20)$	
	a)	Poisson dist	ribution			(20)	
	b)	ANOVA	•			<u></u>	
	c)	Coefficient	of determination			ı ·	
-	d)	Systematic s	sampling				
			COMPULSO	RY QUESTI	ION	·	• .
•	(A)				swer Book, about the following or overwriting is not allowed		
	(1)	Which of the	c following is NOT a me	asure of centi	ral tendency?	(10)	
		a)	Median	b)	Mode		
		· c)	G.M	(d)	Range		
	(2)	A boarder se	ccurity patrol that checks	every passin	g vehicle, is using		i
	( )	a)	Complete enumeratio		Simple random sampling		
		c)	Systematic sampling	<b>d</b> )	Stratified sampling		
			\ \/				
	(3)	In binomial					
	(3)	a)	mean > variance	b)	mean< variance		•
	(3)			b) d)	mean< variance mean ≤ variance		
		a) c)	mean > variance	•			
	(3)	a) c)	mean > variance	•			
		a) c) For regression	mean > variance mean= variance on line, Y = 2 - 5X	d) b)	mean ≤ variance		
	(4)	a) c)  For regression a) c)	mean > variance mean= variance on line, Y = 2 - 5X The Y-intercept is 2	d) b) d)	mean ≤ variance  The Y-intercept is -5 both (a) & (c)		
		a) c)  For regression a) c)	mean > variance mean= variance on line, Y = 2 - 5X The Y-intercept is 2 The slope of line is -5 utcomes of a random expected	d) b) d) periments is c b)	mean ≤ variance  The Y-intercept is -5 both (a) & (c)  alled sample points		
	(4)	a) c)  For regression a) c)  Any set of o	mean > variance mean= variance on line, Y = 2 - 5X The Y-intercept is 2 The slope of line is -5 utcomes of a random exp	d) b) d) periments is c	mean ≤ variance  The Y-intercept is -5 both (a) & (c)		
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	(4)	a) c)  For regressic a) c)  Any set of o a) c)  A complete	mean > variance mean= variance on line, Y = 2 - 5X The Y-intercept is 2 The slope of line is -5 utcomes of a random expectent random variable program to take sample,	d) b) d) periments is c b) d) is called	mean ≤ variance  The Y-intercept is -5 both (a) & (c)  alled sample points event space		
	(4) (5)	a) c)  For regressic a) c)  Any set of o a) c)  A complete a) c)	mean > variance mean= variance on line, Y = 2 - 5X The Y-intercept is 2 The slope of line is -5 utcomes of a random experiment random variable program to take sample, stratum size sampling frame	b) d) periments is c b) d) is called b) d)	mean ≤ variance  The Y-intercept is -5 both (a) & (c)  alled sample points event space		
	(4)	a) c)  For regression a) c)  Any set of o a) c)  A complete a) c)  Which is NO	mean > variance mean= variance on line, Y = 2 - 5X The Y-intercept is 2 The slope of line is -5 utcomes of a random expected random variable program to take sample, stratum size	b) d) periments is c b) d) is called b) d) t estimator?	mean ≤ variance  The Y-intercept is -5 both (a) & (c)  alled sample points event space  unit list sample design		
	(4) (5)	a) c)  For regressic a) c)  Any set of o a) c)  A complete a) c)	mean > variance mean= variance on line, Y = 2 - 5X The Y-intercept is 2 The slope of line is -5 utcomes of a random experient random variable program to take sample, stratum size sampling frame OT the property of a poin	b) d) periments is c b) d) is called b) d)	mean ≤ variance  The Y-intercept is -5 both (a) & (c)  alled sample points event space		
	(4) (5) (6)	a) c)  For regression a) c)  Any set of o a) c)  A complete a) c)  Which is NC a) c)	mean > variance mean= variance mean= variance on line, Y = 2 - 5X The Y-intercept is 2 The slope of line is -5 outcomes of a random expectent random variable program to take sample, stratum size sampling frame OT the property of a poin Unbiasedness Accuracy	d) b) d) periments is c b) d) is called b) d) t estimator? b) d)	mean ≤ variance  The Y-intercept is -5 both (a) & (c)  alled sample points event space  unit list sample design  Consistency Sufficiency	id to be	
	(4) (5)	a) c)  For regression a) c)  Any set of o a) c)  A complete a) c)  Which is NC a) c)	mean > variance mean= variance mean= variance on line, Y = 2 - 5X The Y-intercept is 2 The slope of line is -5 outcomes of a random expectent random variable program to take sample, stratum size sampling frame OT the property of a poin Unbiasedness Accuracy	d) b) d) periments is c b) d) is called b) d) t estimator? b) d)	mean ≤ variance  The Y-intercept is -5 both (a) & (c)  alled sample points event space  unit list sample design  Consistency	id to be	

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ect:	STATI	ISTICS		
(9)	With a lowe a) c)	er level of significance, the Remains same Decreases	ne probability b) d)	of rejecting a true null h Increases None of these t-test Z-test
(10)	,	podness of fit, we use Chi-Square test F-test	b) d)	t-test Z-test
(B)	Write "T" for for following sta	or "True" or "F" for "Fals atements:	se" in your A	nswer Book, as the case
(1)	The coefficient	ent of Kurtosis measures	the spreadne	ss of a distribution.
(2)		umber for a base year is a		
(3)	The probabil	lity of type-l error is also	referred as c	onfidence coefficient.
(4)	Probability a	lways deals with uncerta	inty.	
(5)	Hypegeomet	ric distribution has two p	arameters.	
(6)	Equality of se	everal variances can be to	ested by AN(	OVA.
(7)		of determination can also		
(8)	Poisson distri	ibution has only one para	inieter that is	Variance.
(9)		able is always a real-valu		
(10)		sampling, sampling inte		

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