# MATHS

# BOOKS - UNITED BOOK HOUSE

# HIGHER SECONDARY EXAMINATION 2015

## Exercise

**1.** Find out the correct answer out of the options given against each questions : In

random sampling with replacement from a population with standard deviation $\sigma$ if the sample size is equal to the population size, N, then the standard error of sample mean will be

A. 0

B. $\sigma$

C. $\frac{\sigma}{\sqrt{N}}$

D. $\frac{\sigma^2}{\sqrt{N}}$.

**Answer:**

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**2.** Find out the correct answer out of the options given against each questions : In testing of hypothesis, if the level of significance is 1%, the probability of type-I error is

A. $> 0.01$

B. $\leq 0.1$

C. $> 0.01$

D. $\leq 0.01$

**Answer:**

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**3.** Find out the correct answer out of the options given against each question:If $E(T_1) = \theta_1 + 2\theta_2, E(T_2) = \theta_1 + \theta_2$,then unbiased estimator of $\theta_1$ is-

A. $T_1 + T_2$

B. $\frac{2T_2 - T_2}{T_1 - T_2}$

C. $\frac{T_2 - 2T_1}{5}$

D. $\frac{T_1 - T_2}{2}$

**Answer:**

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**4.** Find out the correct answer out of the options given against each questions : If a random sample $x_1, x_2, \ldots\ldots x_n$, is drawn from $N(\mu, \sigma^2)$, then an estimator obtained by the method of moments for the $\sigma^2$ is

A. $ns^2$

B. $(n-1)s^2$

C. $s^2$

D. $\frac{ns^2}{n-1}$ where $s^2 = \frac{1}{n}\sum_{i=1}^{n}(X_i - \bar{x})^2$ and $\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$

**Answer:**

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**5.** Find out the correct answer out of the options given against each questions : For X having binomial distribution with parameters

$n = 7$ and $p = \frac{1}{3}$, p(X=r) is maximum whenthe value of r is

A. 2.67

B. 2

C. 3

D. none of these.

**Answer:**

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**6.** Find out the correct answer out of the options given against each questions : For a normal distribution the maximum ordinate is equal to

A. $\frac{1}{\alpha\sqrt{2\pi}}$

B. $\alpha\sqrt{2\pi}$

C. $\frac{1}{\sqrt{2\pi}}$

D. $\frac{1}{\sigma}$

**Answer:**

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**7.** Find out the correct answer out of the options given against each questions : If $E(x) = 4, var(x) = 9$, then $E\left(x^2\right)$ equals to

A. 5

B. 7

C. 25

D. none of these.

**Answer:**

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**8.** Find out the correct answer out of the options given against each questions : If x and y are random variables with expectations 3 and 5 respectively, then expectation of (3x - 5y + 16) is

A. 16

B. -16

C. -2

D. 0

**Answer:**

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**9.** Find out the correct answer out of the options given against each questions : In usual notation if $bxy = -1.8$ and $byx = -0.2$, then $r_{xy}$ is equal to

A. 0.6

B. $\pm 0.6$

C. $-0.6$

D. none of these.

**Answer:**

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**10.** Find the probability that the birth days of six different persons will fall in exactly two calendar months.

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**11.** Answer the following questions: In testing of hypothesis define power.

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**12.** Answer the following questions: Give an example of upward trend of time series.

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**13.** Answer the following questions: Name the four components of time series.

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**14.** Answer the following questions: What do you mean by process control?

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**15.** Answer the following questions: If X is a discrete random variable, then define median of X.

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**16.** Answer the following questions:State the condition under which the binomial distribution is symmetric.

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**17.** Answer the following questions: Which distribution has its mean equal to its variance?

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**18.** Answer the following questions: Mention some main factors behind seasonal variations of time series.

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**19.** Answer the following questions in short: If the correlation coefficient between x and y is 0.5, find the correlation coefficient between 5x and -4y.

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**21.** Answer the following questions in short: If X follows a symmetric binomial distribution with n = 36, calculate E [X(X -1)].

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**22.** Answer the following questions in short: Find the maximum value of the variance of a random variable X following binomial distribution.

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**23.** Answer the following questions in short: Show that points of inflexion of a normal curve are at $x = \mu \pm \sigma$.

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**24.** Answer the following questions in short: State under what conditions poisson distribution may be obtained as a, limiting form of a binomial distribution.

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**25.** Answer the following questions in short:

Define MVUE.

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**26.** Answer the following questions in short:

Let T be an unbaised estimator of $\theta$, show that $\sqrt{T}$, in general, is baised for estimating $\sqrt{\theta}$.

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**27.** Answer the following questions in short: Prove that regression coefficients do not depend on change of origin but depend on change of scale.

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**28.** Answer the following questions in short: In case of perfect disagreement show that spearman's Rank correla tion coefficient is equal to - 1.

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**29.** Answer the following questions in short:

Two boys A and B toss a fair coin 4 times each: Find the probability of getting same number of heads.

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**30.** Answer the following questions in short:

Define MVUE.

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**31.** Answer the following questions in short: When mean and mode of binomial distribution are same?

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**32.** Answer the following questions in short: Find the probability that specified member is included in an SRSWOR sample of size n from a population of size N.

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**33.** Find out the correct answer out of the options given against each question:If $E(T_1) = \theta_1 + 2\theta_2, E(T_2) = \theta_1 + \theta_2$,then unbiased estimator of $\theta_1$ is-

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**34.** Answer the following questions in short: Define type-I error and Type-II error in the

context of testing of a hypothesis.

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**35.** Answer the following questions in short: Reduce the trend equation $Y_\tau = 144 + 16\tau$ for yearly totals, to monthly trend equation. Given that origin is at 1989 and unit of $\tau = 6months.$

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**36.** Answer the following questions in short: Define Spearman's Rank-correlation coefficient and drive, it when there are no, ties.

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**37.** Answer the following questions : Write down two demerits of determining trend by moving average method.

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**38.** Answer the following questions in short: Give the procedure of Construction of control charts for number of defectives, in both cases when standards are given and not given.

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