

**B.A. (Honours) Examination, 2018**  
**Semester-III (CBCS)**  
**Economics**  
**Course: CC-7 (Core)**  
**(Statistical Methods for Economics)**

**Time: Three Hours**

**Full Marks: 60**

Questions are of value as indicated in the margin  
 Answer *any four* questions

1. (a) Define the terms: frequency, relative frequency, cumulative frequency (of less than and more than types) and frequency density. 4×3=12
- (b) Draw the histogram of the following frequency distribution of heights of 100 college students. 3

Height (cm.)	141 – 150	151 – 160	161 – 170	171 – 180	181 – 190	Total
Frequency	5	16	56	19	4	100
2. (a) Prove that  $A.M. \geq G.M. \geq H.M.$ , where A.M., G.M. and H.M. represent arithmetic mean, geometric mean and harmonic mean, respectively. 10
- (b) Find the median of the data given below: 5

Class boundaries	15 – 25	25 – 35	35 – 45	45 – 55	55 – 65	65 – 75	Total
Frequency	4	11	19	14	0	2	50
3. (a) Prove that the standard deviation is independent of any change of origin, but is dependent on the change of scale. 6
- (b) Find the mean and the standard deviation of the first n natural numbers. 9
4. (a) Explain the terms ‘Skewness’ and ‘Kurtosis’ used in connection with the frequency distribution of a continuous variable. 5
- (b) Give the measures of skewness and Kurtosis. 5
- (c) The first four moments of a distribution about the value 3 are 2, 10, 40 and 218. Find the moments about origin and the mean. 5
5. (a) Deduce Spearman’s formula for rank correlation coefficient in case of without tie. 6
- (b) Prove that the correlation coefficient lies between –1 and +1. 9
6. (a) Mean and the variance of a group of 100 observations are 6.5 and 3.0 respectively. 55 of these observations have mean 6.6 and standard deviation 1.5. Find the mean and the standard deviation of remaining 45 observations. 8

**P.T.O.**

(2)

- (b) In a contest, two judges ranked seven candidates in order of there as in the following table:

Candidates	A	B	C	D	E	F	G
Rank by Judge I	2	1	4	5	3	7	6
Rank by Judge II	3	4	2	5	1	6	7

Calculate the rank correlation coefficient. 7

7. (a) Define probability mass function and probability density function. 4  
(b) Check whether the following is a density function or not. 4

$$f(x) = \begin{cases} \frac{1}{\theta} e^{-x/\theta} & \text{for } 0 < x < \infty \\ 0 & \text{elsewhere} \end{cases}$$

- (c) Define mathematical expectation. 3  
(d) If  $X$  is a stocastic variable and  $a$  and  $b$  are constants, then show that  $\text{Var} (a X + b) = a^2 \text{Var} (X)$ . 4
8. Write short notes on **any two** of the following: 7.5×2=15

- (a) Relative measure of dispersion  
(b) Mean of composite group  
(c) Relation between central and non-central moments  
(d) Derivation of regression equation
-