

# Indian Statistical Institute

Bangalore Centre

MS(QMS) First Year

First semester – Statistics for Decision Making 1

Mid-semester exam (September 15, 2018)

Maximum marks: 100

Time: 3 hrs

1. Following data on 25 companies relating to rate on dividend per share were collected randomly from the Ahmedabad stock exchange list.

15    35    20    10    5    15    20    15    12    13    15    14    10  
8    10    6    8    12    11    10    40    15    12    13    15

- (a) Construct a frequency distribution and a relative frequency distribution. [20]  
(b) Construct the following using the above data: (i) Dot plot, (ii) Histogram and (iii) Box Plot. [30]  
(c) Find out the (i) Mean, (ii) Standard Deviation, (iii) Skewness  $\beta_1$  and (iv) Kurtosis  $\beta_2$ . [Show calculations] [20]
2. The following data is extracted from a famous article Messerli (2012), *Chocolate Consumption, Cognitive Function, and Nobel Laureates*, New England Journal of Medicine. The data corresponds to the number of Nobel laureates for 10 million inhabitants in 23 countries and chocolate consumption (kg/yr/capita) in these countries.

Country	Annual per capita chocolate consumption	No. of Nobel laureates per 10 million population
China	0.70	0.058
Brazil	2.90	0.050
Japan	1.75	1.094
Portugal	2.00	2.685
Greece	2.20	1.897
Spain	3.90	1.755
Poland	3.50	3.190
Italy	3.75	3.879
Canada	4.00	6.253
Australia	4.60	5.141
Belgium	4.50	9.005
France	6.35	9.177
Finland	7.40	7.371
The Netherlands	4.60	11.837
United States	5.45	10.842
Ireland	9.00	13.967
Germany	9.80	12.572
United Kingdom	10.00	19.165
Austria	8.80	24.720
Norway	9.50	21.814
Denmark	9.00	25.915
Sweden	6.60	30.330
Switzerland	12.15	30.949

- (a) Construct a two-way bivariate frequency table by choosing appropriate classes and compute the marginal frequency distributions for both chocolate consumption and number of Nobel laureates. [10]  
(b) Plot a Scatter Diagram to explore the relationship. [10]  
(c) Find the Correlation Coefficient. [10]  
(d) Is the number of Nobel laureates by country correlated with chocolate consumption? Explain your answer. [10]