



SB-4526

**M. H. R. D. (Part - I) (Sem. II) (Reg.) Examination**  
**March / April - 2011**  
**Applied Statistics**

Time : 3 Hours]

[Total Marks : 70

**Instructions :**

(1)

नीचे दृष्टावेक निशानीवाणी विगतो उत्तरवही पर अवश्य कभवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
☛ M. H. R. D. (PART - 1) (SEM. 2) (REG.)	<input type="text"/>
Name of the Subject :	<input type="text"/>
☛ APPLIED STATISTICS	<input type="text"/>
☛ Subject Code No. : <input type="text" value="4"/> <input type="text" value="5"/> <input type="text" value="2"/> <input type="text" value="6"/> ☛ Section No. (1, 2,.....) : <input type="text" value="NIL"/>	<input type="text"/>
	Student's Signature

- (2) All questions are compulsory.
- (3) State your options clearly.
- (4) Figures to the right indicate full marks.
- (5) Use of simple calculator is allowed.

- 1 (a) Fill in the blanks : 6
- (i) When outliers are present in the data then to find average we use \_\_\_\_\_.
  - (ii) If the dependent variable in the series decreases as the independent variable increases, the relationship is \_\_\_\_\_.
  - (iii) When the population is non-normal then we use \_\_\_\_\_ test.
- (b) Answer the following questions : 8
- (i) If the value of  $b_{yx}$  is  $-0.04$  and  $b_{xy}$  is  $-1.6$  then find the value of correlation coefficients.
  - (ii) For binomial distribution mean = 12 and variance is 4 then find the value of  $n$  and  $p$ .
  - (iii) Find the mode of 2,2,5,7,2,7,8,10
  - (iv) The price of a commodity doubles in a period of 5 years. What will be the average rate of increase per annum ?

- 2 (a) Explain the meaning and limitations of statistics. 7  
 (b) Compute price index and quantity index number for 7  
 the year 2010 with 2005 as base year using  
 (i) Laspeyre's method  
 (ii) Passche's method

Commodities	Quantity in Units		Value in Rs.	
	2005	2010	2005	2010
A	100	150	500	900
B	80	100	320	500
C	60	72	150	360
D	30	33	360	297

OR

- 2 (a) Explain the important functions of statistics and 7  
 discuss the factors in construction of index number.  
 (b) The following table gives the annual income of a 7  
 person and the general price index number for the  
 period 2001 to 2007. Prepare index number to show the  
 changes in the real income of the person :

Year	2001	2002	2003	2004	2005	2006	2007
Annual Income							
in Rs.	80,000	81,900	82,500	87,600	92,000	93,800	92,400
Price index number	100	105	110	120	125	140	140

- 3 (a) What are the measures of dispersions ? 2  
 (b) Six types of workers are employes in each of two 6  
 workshops, but at different rate of wages as follows :

Types of worker	Workshop A		Workshop B	
	Rate of wages per worker (Rs)	No. of worker	Rate of wages per worker (Rs)	No. of worker
Mechanic	250	02	300	18
Fitter	350	14	300	50
Electrician	400	20	425	08
Carpenter	300	07	350	12
Smith	300	06	350	10
Clerk	200	01	500	02

In which of the two workshops, is the average rate of wages per worker higher and by how much ?

- (c) Answer the questions by using the statistical measures 6  
 given below. The data relate to production in three  
 factories :

Factory	A	B	C
Mean	800	780	830
Median	800	790	810
S.D.	30	40	60
Quartile Deviation	16	30	40

- (i) In which factory, the production is more variable ?  
(ii) What is the production ranges of factories for the middle half of the period ?

**OR**

- 3 (a) Explain the difference between mean and median by examples. 2
- (b) A non government organization decided to give pension to the senior citizens (age 60 and above 60). The scales of pension were find as follows : 6  
Age Group : 60-65 65-70 70-75 75-80 80-85 85 & above  
Rs Per month : 400 500 600 700 800 1000  
The ages of the 30 persons who secured the pension are given below :  
62, 65, 68, 72, 75, 77, 82, 85, 90, 78, 75, 61, 60, 68, 72, 72, 78, 79, 80, 82, 68, 75, 94, 98, 73, 77, 68, 65, 71, 89  
Calculate the monthly average pension payable and the standard deviation..
- (c) From the prices of the shares A and B below, state which is stable in value : 6  
A : 110 108 104 106 112 116 104 100 102 98  
B : 216 214 210 210 212 214 208 206 208 202

- 4 (a) Explain the difference between correlation and regression in brief. 2
- (b) An examination of 8 applicants for clerical post was taken by a firm from the marks obtained by the applicants in the written exam and personal interview. Find the most likely marks in personal interview when marks in written exam are 30. Also find correlation coefficient. 6  
Marks in written exam : 25 28 35 32 31 36 29 38 34 32  
Marks in personal interview : 43 46 49 41 36 32 31 30 33 39
- (c) Fit the straight line to the given data and estimate the production for the year 2010. 6  
Year : 2005 2006 2007 2008 2009  
Production : 40 50 62 58 60

**OR**

- 4 (a) What are the factors of time-series ? 2
- (b) Following table gives the information about the number of years of car been used and maintenance. Estimate maintenance for car which used for 3 years. Also find the correlation coefficient between number of years and maintenance : 6  
No. of years 2 4 6 7 8 10 12  
Maintenance 1600 1500 1800 1900 1700 2100 2000

- (c) Fit the parabola for the following data. Also estimate sales for the year 2004 : 6
- |         |      |      |      |      |      |
|---------|------|------|------|------|------|
| Year :  | 1999 | 2000 | 2001 | 2002 | 2003 |
| Sales : | 7    | 9    | 10   | 7    | 5    |

- 5 (a) Define type of errors. 2
- (b) The probability that in certain correspondence course student will graduate is 0.4. Determine the probability that out of 5 students (a) none (b) one and (c) atleast one will be graduate. 6
- (c) On launching the AIDS programme, the WHO selected a sample of 120 respondents from Delhi, 110 from Chennai, 140 from Hyderabad and 160 from Bangalore. On examining each sample, the nubers of those knowing and not knowing the new programme were found as under. Do the data significantly differ in terms of knowing and not knowing in your cities ? Use  $\chi^2$ -test : 6

	Knowing	Not knowing
Delhi	40	80
Chennai	60	50
Hyderabad	80	60
Bangalore	90	70

OR

- 5 (a) Give assumptions of Analysis of Variance (ANOVA) 2
- (b) An MHRD and MBA applicant appear in an interview for two vacancies in the same academic institute. The probability of MHRD student's selection is  $1/7$  and that of MBA student's is  $4/5$ . What is the probability that
- (i) Both of them will be selected
  - (ii) Only one of them will be selected
  - (iii) None of them will be selected
- (c) Two laboratories carry out independent estimates of fat content for ice-cream made by a certain firm. A sample is taken from each batch and sent to the two laboratories. They obtain the following results. Do the estimate of mean about ice-cream fat in Lab. A and Lab. B differ significantly ? 6
- |          |   |   |   |   |   |   |   |   |   |    |
|----------|---|---|---|---|---|---|---|---|---|----|
| Batch :  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Lab. A : | 7 | 8 | 7 | 3 | 8 | 6 | 9 | 4 | 7 | 8  |
| Lab. B : | 9 | 8 | 8 | 4 | 7 | 7 | 9 | 6 | 6 | 6  |