Department of Computer Applications   BBDNITM, Lucknow

BCA(C-503): Statistical Computing

Q1. Find the AM, GM, HM of the following-
   (i) 15, 25, 35,12,14,9,18,20
   (ii) 23, 16, 17,21,8,7,39

Q2. Find the mean deviation about the median of the following:
   8,15,53,49,19,62,7,15,95,77.

Q3. Find the mean deviation about arithmetic mean of each of the following distribution
   27, 33,49,61,76,104,126.

Q4. Find the standard deviation for following distribution
   1, 2,3,4,5,6,7,8,9,10,11

Q5. Prove the variance of the first n positive integer is: $(n^2-1)/12$

Q6. The average weight of the following distribution is 58.5kg. Find the value of X?

Weight in kg	50	55	60	X+12.5	70
Frequency	1	4	2	2	1

Q7. The table given below the no. of candidate obtain X or higher marks in certain
   examination. Calculate the mean and median marks obtained by candidate?

No. of students	10	20	30	40	50	60	70	80	90	100
Marks(X)	140	130	118	100	75	45	25	9	2	0

Q8. From the following frequency distribution two class frequencies are missing and the
   total frequency is 900 and median is 100.048. find the two missing frequencies?

C I	55-64	65-74	75-84	85-94	95-104	105-114	115-124	125-134	135-144
F	2	19	78	?	301	?	94	14	4

Q9. The table given below the frequency distribution of weight of 85 apples.
   determine median weight of apple and find its mode?

Weight	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189
Freq.	5	8	12	18	22	9	7	4

Q10. Calculate the median and mode of the following table

Annual sales	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60
frequency	4	20	35	55	62	67

Q11. The table below given the no. of candidate obtaining marks 'X' or higher in a certain
   examination. Calculate the mean and median marks obtained by the candidate.

X	10	20	30	40	50	60	70	80	90	100
F	144	133	118	100	75	45	25	9	2	0

Q12. Find the 1st and 3rd quartiles, 6th and 9th deciles and 46th and 67th percentiles
   from. the following distribution?

X	20-25	25-30	30-35	35-40	40-45	45-50
F	5	70	100	180	150	120

Q13. From the following frequency distribution calculate the quartile deviation.

X	300-399	400-499	500-599	600-699	700-799	800-899	900-999	1000-1099	1100-1199
F	14	46	58	76	68	62	48	22	6

Q14. Find the mean deviation about mean from the following frequency distribution and evaluate S.D also.

Heights	60-62	63-65	66-68	69-71	72-74
F	5	18	42	27	8

Q15. The mean and the S.D of a sample of 100 observations work calculated as 40 and 5.1 respectively, by a student who took by mistake 50 instead of 40 for 1 observations. Calculate the correct mean and S.D

Q16. The first of two samples have 100 items with mean 15 and S.D 3. If the whole group have 250 item with mean 15.6 and S.D $\sqrt{13.44}$. find the S.D of second group.

Q17. The Mean and Standard Deviation of a sample of 100 observations were calculated as 40 and 5.1 respectively by mistake. Calculate the correct Mean and Standard Deviation?

Q18. The first two samples have 100 items with Mean 15 and SD is 3. If the whole group have 250 items with Mean 15.6 and SD is $\sqrt{13.44}$. Find the SD of second group?

Q19. The scores of two batsmen A and B in ten innings during a certain season are as Follows. Which Batsman is more consistent?

A	32	28	47	63	71	39	10	60	96	14
B	19	31	48	53	67	90	10	62	40	80

Q20. Find out the standard deviation from the following table giving the weight of 200 Person:

Weigth in kg	50	55	60	65	70	Total
No. of men	30	40	65	50	15	200

Q21. Find the mean deviation about the median from the following distribution

Class-interval	2-6	6-10	10-14	14-18
Frequency	6	8	4	2

Q22. Find the coefficient of variation of the following values
40,30,80,60,50,90,70

Q23. Find the standard deviation of the following frequency distribution of the daily wage of 500 workers in a factory

Daily wages	25	36	45	55	65
No. of workers	60	130	150	130	30

Q24. Calculate Pearson's coefficient of correlation from the following taking 100 and 50
.   as the assumed average of X and Y respectively.

X	104	111	104	114	118	117	105	108	106	100	104	105
Y	57	55	47	45	45	50	64	63	66	62	69	61

Q25. The coefficient of rank correlation between the marks in statistics and maths obtained by a certain group of students is 2/3 and sum of the squares of the differences in ranks is 55. Find the number of students in the group?

Q26. Calculate the coefficient of correlation using the method of concurrent deviation between supply and demand given below

Supply	65	40	35	75	63	80	35	20	80	60	50
Demand	60	65	50	56	30	70	40	35	80	75	80

Q27. Find the two regression equation from the following data

Sales	91	97	108	121	67	124	51	73	111	57
Purchase	71	75	69	97	70	91	39	61	80	47

Q28. You are given variance of y=16. The regression equation are
4x-5y+33=0 and 20x-9y=107, Find
    i)   The average values of x and y
    ii)   Correlation coefficient between x and y
    iii)   SD of x

Q29. Find the first four moments about the mean from the following data

Class interval	0-10	10-20	20-30	30-40
Frequency	1	3	4	2

Q30. Find the regression equation of x and y from the following data:
$\Sigma x=24$ $\Sigma y=44$ $\Sigma xy=306$ $\Sigma x^2=164$ $\Sigma y^2=574$ N=4

Q31. Find both the regression equation from the following data:
$\Sigma x=60$ $\Sigma y=40$ $\Sigma xy=1150$ $\Sigma x^2=4160$ $\Sigma y^2=1720$ N=10

Q32. Two lines of regression are given by X+2Y=5 and 2X+3Y=8 and var(x)=12.Calculate the value of X',Y',var(y),r.

Q33. Given the regression lines as 3X+2Y=26 and 6X+Y=31.Find their point   of intersection and interpret it .Also find the correlation coefficient between X and Y.

Q34. Given the following data:
Correction coefficient between X and Y=0.66

	X	Y
Arithmetic Mean	36	85
Standard Deviation	11	8

Find the two regression equation.

Q35. Explain the following terms with a suitable example for each:
    (a) Events
    (b) Elementary and compound event
    (c) Equally likely events
    (d) Mutually exclusive events
    (e) Sample space
    (f) Outcome
    (g) Exhaustive set of events

Q36. If one card is drawn at random from a well shuffled pack of 52 cards. Find the chance
that the card is
i)   A diamond
ii)   Not a diamond
iii)   An ace
iv)   Either a spade or a heart

Q37. Find the probability that in a game of bridge a hand of 13 cards will contain all the 4
aces?

Q38. There are 4 white , 2 red Balls in a bag. If a ball is drawn out at random, three time in
succession without replacement .What is chance that all the three would be white

Q39. Three cards are drawn from a pack of 25 cards, each being replaced before the next one
is drawn .Compute the probability that all are:
 (a) Spades   (b)Aces   (c) Red

Q40. One bag contain 4 red and 2 black ball another bag contain 3 red and 5 black balls is
drawn from each bag .Determine the probability that:
 (a)both are red (b) both are black (c) one is red and one is black

Q41. There are 4 balls in a bag: white, red, green and blue. If a ball is drawn out at random 3 .
times in succession. What is the chance that all the 3 would be white (assume that ball
is replaced after each drawing).

Q42. A bag contains 5 red and 3 black balls & 2nd bag contain 4 red and 5 black balls. One
of these is selected at random and draw of 2 balls is made from it. What is the
probability that one of them is red & other is black.

Q43. One bag contains 8 White and 5 black balls another bag contains 5 White and 3 black
balls is drawn from each bag .Determine the probability that:
 (a)both are white (b) both are black (c) one is white and one is black

Q44. A bag contains 4 green and 6 red balls. A ball is drawn at random and then without
replacing if a second balls is drawn what is chance that a green is drawn each time .

Q45. A problem in statistics is given to three student A,B,C .Whose chances to solving it are
1/3,1/4,1/5 respectively .What is the probability that the problem will be solved.

Q46. Given that P(A)=3/8, P(B)=5/8 AUB=3/4.Find P(A/B) and P(B/A) .Are A & B are
independent .

Q47. A speaks truth is 60% and B speak 75% of the cases in what percentage of cases are
they likely to contradict each other stating the same fact.

Q48. A and B are two events not mutually exclusive connected with a random experiments E.
if P(A)=1/4, P(B)=2/5 and P(AUB)=1/2. Find the value of the following probabilities-
 i)   P(A∩B)
 ii)   P(A∩B^c)
 iii)   P(A^c∩B^c)

Q49. There are two identical boxes containing respectively 4 white & 3 red balls and 3 white
& 7 red balls. A box is chosen at random and a ball is drawn it. If the ball is white what
is the probability that it is from the first box?

Q50. From a pack of 52 cards an even nos. of card is drawn. Show that the probability that these consist of half red & half black is $((52!/26!^2)-1)/(2^{51}-1)$.

Q51. In a examination 30%, 35% & 45% failed in statistics, in mathematics, in at least one of the subject respectively. An examinee selected at random find the probability that
(a). He failed in mathematics only
(b). He passed in statistics if it is known that he failed in mathematics.

Q52. In 10 independent throws of a defective die the probability that an even number will be appear 5 times is twice than the probability that an even number will be appear 4 times. Find the probability that an even number will not appear at all in 10 independent throws in die.

Q53. If 2% of electric bulb manufactured by a certain company are defective. Find the probability that in a sample of 200 bulbs:
(a). Less than 2 bulbs are defective.
(b). More then 3 bulbs are defective.

Q54. What is the probability of guessing correctly at least 6 of the 10 answers in TRUE-FALSE objective test? Using binomial distribution.

Q55. Find the probability that at most 5 defective bolts will be found in a box of 200 bolts. If it is known that 2% of such bolts are expected to be defective.Using poison distribution.

Q56 An unbrased coin is tossed items . if x denotes the number of heads , from the distribution of x by writing down all the possible outcomes and hence calculate the expected value and variance ?

Q57. A machine produced 2% of defected article on an average . if four articles are choosen randomly . what is the probability that there will be exactly 2 defective article?

Q58. In a business venture a man can make a profit of Rs.2,000 with a probability of 0.4 or have a loss of Rs.1,000 with a probability of 0.6 what is his expected profit?

Q59. A box contains 15 electric bulbs of which 5 are defective. A man select 3 bulbs at random . find the expected number of defective bulbs in his selection.

Q60. Eight coins are thrown simultaneously. Find the probability of obtaining
(i) exactly 6 heads
(ii) at least 6 heads.

Q61. If a sample of 5 item is drawn randomly from a lot containing 10% defective items, what is the probability of getting not more than one defective item.

Q62. A man draws 2 balls from a bag containing 3 white and 5 black balls if he is to receive Rs.14 for every white ball and Rs. 7 for every black ball drawn, what is his expectation

Q63. If the probability of a defective bulb be 1/5 finds the following for the binomial distribution of defective bulbs in a total of 400 bulbs.
a.   The mean.
b.   The standard deviation.

Q64. Two types of batteries are tested for their length of life and the following data are obtained:

	No of samples	Mean life in hours	Variance
Type A	9	600	121
Type B	8	640	144

Is there a significant difference in the two means ? Value of t for 15 degrees of freedom at 5% level is 2.131.

Q65. A die is thrown 150 times with the following:

No turned up	1	2	3	4	5	6
Frequency	19	23	28	17	32	31

Test the hypothesis that the die is unbiased.[Given $X^2 0.05,5=11.07$]

Q66. In a sample of 10 observations, the sum of the squares of the deviations of items from their mean is 130.5 .In another samples of 14 observation ,the value is found to be 148.5. Test whether the difference is significant at 5% level.[You are given at that at 5% level for 9 and 13 degrees of freedom the value of F is 2.71.]

Q67. A random sample of size 7 from a normal populations gave a mean 977.51 and a standard deviation 4.42.Find a 95% confidence intervals for the population mean.(Given: $t_{0.05;6} =1.943, t_{0.05;7} = 1.895, t_{0.025;6} = 2.447, t_{0.025;7} = 2.365$) Find the value up to two places of decimal).

Q68. The foreman of ABC mining company has estimated the average quantity of iron ore extracted to be 36.8 tonnes per shift and the sample S.D to be 2.8 tonnes per shift ,based upon a random selection of 4 shifts .Construct a 90% confidence intervals around this estimate .(At 10% level of significance the table value of t for 3 d.f. is 2.353).

Q69. What is time series ? what is the need analyse a time series ? Enumerate the difference methods of finding the secular tend.

Q70. What are the components of time series? With which component of a time series would you mainly associate each of the following:
  (a)   A fire in a factory delaying production by 4 weeks ;
  (b)   An after puja sale in a department store
  (c)   The increased food production due to a constant increase in population;
  (d)   A recession ;
  (e)   General increase in the sale of TV sets .

Q71. Fit a straight line trend by the method of least squares (taking 1985 as year of origin) to the following data concerning sales of a certain firm:

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989
Sales('000Rs.)	48	55	63	65	72	84	90	87	82

Q72. Calculate trend values for the following data relating to the production of tea in India by moving average method, on the assumption of a four-yearly cycle:

Year :	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Production (mm. lb). :	464	515	518	467	502	540	557	571	586	612

Q73. Fit a straight line trend by method of least square to the following data and find by which year the production will reach 63 million tons:

Year:	1997	1998	1999	2000	2001	2002	2003	2004
Production (million tons)	50.3	52.7	49.3	57.3	56.8	60.7	62.1	58.6

Q74. Obtained the 5 year moving average for the following data-

Year	1970	1971	1972	1973	1974	1975	1976	1977	1978
Sale	36	43	43	34	44	54	34	24	14

Also construct the 4 year centered moving averages?

Q75. The table below gives the figure of production of a commodity during the year 1991-1995 in the state of Punjab-

Year	1991	1992	1993	1994	1995
Production in '000	10	12	8	10	11

Use the method of least square to fit a straight line to the data from this result. Find the trend value of different years (Take 1993 as origin of X-axis)