



PART – A

I. Answer any ten of the following questions:

10×1 =10

1. Define radix?
2. If the current year price index is 175, what would you conclude?
3. State any one norm (consideration) for the selection of base year?
4. Give an example for a Bernoulli variate.
5. Define time series.
6. What is the value of a coefficient of skewness for a normal distribution?
7. What is parameter?
8. Define null hypothesis.
9. What is interval estimation?
10. SQC helps in detecting which type of variation?
11. Define rectangular game.
12. Define E.L.S (Economic Lot Size).

PART – B

II. Answer any 10 questions, each question carries two marks:

2×10 =20

13. Explain briefly the registration method of collection of vital statistics.
14. Comment on the statement "Index numbers are economic barometer's."
15. Given $\sum p_0q_1 = 172$ and $\sum p_0q_0 = 192$. Compute suitable quantity index number
16. Diagrammatically represent 'Business Cycle' with stages.
17. Define interpolation and extrapolation.
18. If the parameter of t-distribution is 6, then find its variance?
19. In a normal distribution if variance is 9cm^2 the find quartile deviation.
20. Write down two utilities of standard error.
21. What is type I and type II error?
22. From the manufacturing process the mean fraction defectives are known to be 0.12. For a sample size of 40, write down the suitable control limits.
23. In an L.P.P. define (i) feasible solution (ii) Multiple solution.
24. Given $R = 1000$ units/month, $C_3 = \text{Rs } 350$ and $C_1 = \text{Rs } 0.20/\text{unit/month}$ find Q^0 .

PART – C

III. Answer any 8 questions: each carries Five marks :

8×5

= 40

25. Find the total fertility for the following data.

Age(years)	15-19	20-24	25-29	30-34	35-39	40-44	45-49
No of live births	840	1350	2800	1200	1040	500	120
Women Population	14,000	15,000	14,000	13,000	12,000	11,000	10,000

Also calculate the average number of children born per women.

26. From the following data compute weighted G.M price index number,

Item	A	B	C	D	E
2008 Price (2)	80	120	100	120	80
2012 Price (2)	120	150	80	90	100
Weights	3	2	2	1	2

27. What are the steps involved in the construction of index number? Explain any three.

28. For the following time series obtain the trend values by finding 4-yearly moving averages.

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014
Profit (in lakh)	12	16	8	20	24	36	32	40	42

29. Interpolate and extrapolate the production for the year 2006 and 2010 or the following data.

Year	2005	2006	2007	2008	2009	2010
Production (in Tons)	5	-	10	15	26	-

30. In an industry the workers have 15% chance of suffering from an occupational disease. Among 5 randomly selected workers, find the probability that among the selected workers, i) 2 workers contract the disease ii) at most 2 workers will contract the disease.

31. A bowl contains. 5 white balls and 4 red balls. Two balls are taken at random. Find the probability that a) both are red b) one is red ball.

32. Among 400 randomly selected persons of a city 260 were coffee drinkers. Test at 5% level of significance that majority of the people in the city drink coffee.

33. The standard deviation of weights of 15 new born babies 0.36 kgs. Test at 5% L.O.S. that the standard deviation of weights of new born babies is less than 0.4kg.

34. In a printing industry at regular intervals cloth is inspected for defects in printing. If on an average 0.5 defects are expected per square meter, obtain suitable limits.

35. A machine costs Rs 8000. Its maintenance cost and resale value per year are given in the following table. Determine the optimal replacement age of the machine.

Year	1	2	3	4	5	6	7
Maintenance Cost	1000	1300	1700	2200	2530	3100	3500
Resale Value	4000	3000	2750	2000	1850	1500	9000

36. Solve the following game using the principle of dominance.

Player B

B_1 B_2 B_3 B_4

Player A
$$\begin{matrix} A_1 \\ A_2 \\ A_3 \end{matrix} \begin{bmatrix} 1 & 2 & 0 & -3 \\ 4 & 6 & 3 & 5 \\ 3 & -1 & -2 & 0 \end{bmatrix}$$

PART – D

IV. Answer any of the following 2 questions, each questions carries Ten marks: 2×10 =20

37. From the following data calculate the STDR, hence find the locality with healthier population

Age (years)	Location A		Locality B		Standard Population
	Population	Deaths	Population	Deaths	
Less than 20	9,000	81	8,000	80	15,000
20-40	38,000	152	40,000	200	25,000
40-60	20,000	200	30,000	360	40,000
60 & above	7,000	133	12,000	240	10,000

38. Calculate Marshall-Edge worth's and Dorbish-Bowley price index numbers. Test they satisfy TRT.

Items	2012		2014	
	Price (Rs)	Quantity	Price (Rs)	Quantity
A	12	14	14	15
B	16	17	20	16
C	11	18	13	19
D	10	15	9	14

39. Production figures of a sugar factory in 1000 quintals are given below

Year	2001	2002	2003	2004	2005	2006	2007
Production (000's qtls)	12	10	14	11	13	15	16

- (a) Fir a straight line trend to the above data
- (b) Estimate the production from 2009
- (c) Obtain the trend values and show the trend line on a graph.

40. a) The following data were obtained for number of defective items for a sample of size 5 for 500 samples during a week.

No of defective items	0	1	2	3	4	5
No of samples	170	180	120	20	8	2

Fit a Binomial distribution to the data

b) Following are the number of accidents occurred in a city in a year tabulated according to the day of occurrence.

Day	Sun	Mon	Tue	Wed	Thus	Fri	Sat	Total
Accidents	7	16	8	15	11	11	16	84

Test whether there is day-wise equidistribution of accidents

PART – E

V. Answer any 2 of the following questions, each question carries five marks: 2 × 5 =10

41. X is a normal variate with mean 64 and variance 144. Determine (i) P(X>67) (ii) P (60 < X<66)

42. A random sample of 400 tins of Vanspathi has mean weight 4.96 kg and 5.D. 0.4kg. Test at 1% I.o.s that the average weight of this of vanaspathi is less than 5kg.

43. If the 500 workers in a factory exposed to an epidemic 350 in all were attacked, 200 had been inoculated and of these 100 were attacked. Test whether inoculation and attack are indenendent.

44. Determine an initial basic feasible solution to the following transportation problem by NWCR. Compute the transportation cost.

	To	

		D ₁	D ₂	D ₃	Supply
	O ₁	8	4	12	500
From	O ₂	10	5	6	200
	O ₃	7	5	3	100
Demand		400	200	200	800
