SYBA
Stats practical - III

MN3ADJ

Time: 1 $^{1}/_{2}$ Hrs **MARKS-40**

NOTE:

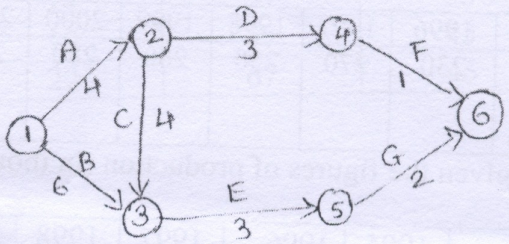
1) **Attempt all questions**
2) **All questions carry equal marks**
3) **Figure to the right indicate marks assigned.**

Q1 **Attempt any two.**

A. Draw the network diagram for following set of activity and identify the critical path **(5)**

Activity	A	B	C	D	E	F	G
Proceding Activity	----	----	A	B	C	D	E & F
Time	3	4	4	2	2	2	5

B. A Network diagram for a small project is given below **(5)**
Find (a) Earliest and latest starting and finishing times
(b)total float



C. M/S BMS have taken up a special project consisting of 8 activities whose three point time estimates are listed in the table below Activities are marked with their node numbers **(5)**

Activity Node Number	Time Estimates In weeks		
	optimistic time	most likely time	Pessimistic time
1-2	1	3	5
1-3	2	4	6
2-5	3	5	7
2-4	5	6	7
5-6	5	7	9
4-6	6	8	10
3-6	7	9	11
6-7	2	3	4

Draw the PERT Network for the project and indentify the critical path

Q2. **Attempt any two**

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A. A population consists of four units with values 2,4,5,7 write all possible samples of size 2 assuming simple random sampling with replacement (WR) find the mean $\bar{y}$ for all such samples. Also find the population mean $\bar{Y}$ and population variance σ^2 and verify $E(\bar{y})=\bar{Y}$ (5)

B. Enumerate all possible simple random sample without replacement of size 3 from a population of six units with value 1,3,4,7,9,10 also find sample mean $(\bar{y})$ population mean $(\bar{Y})$ and verify $E(\bar{y})=\bar{Y}$ (5)

C. For the small population containing 6 units 2,5,7,11,16 and 19 write down all possible simple random sample of size 2 (WOR) from this population show that $E(\bar{y})=\bar{Y}$ Also calculate sample variance. (5)

Q3. Attempt any two

A. The following table gives the number of workers employed in a small industry during the year 1996-2004 calculate the four-yearly moving Average (5)

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004
No of Employees	230	270	250	260	280	270	300	290	280

B. Below are given the figures of production (in thousand tones) of a fertiliser factory (5)

Year	1995	1996	1997	1998	1999	2000	2001
Production ('000 tonnes)	77	88	94	85	91	98	90

Fit a straight line by the 'Least squares method' and tabulate the trend values. estimate the given value for 2004 Also plot graph on graph paper.

C. Fit a parabolic curve of second degree to the data given below and estimate the given value for 2004 and comment on it (5)

Year	1999	2000	2001	2002	2003
Production('000 Rs)	12	11	13	14	9

Q4. Attempt any two (5)

A. You have given the population figures of India as follows

Census Year (x)	1911	1921	1931	1941	1951	1961	1971
Population (in crores)	25.0	25.1	27.9	31.9	36.1	43.9	54.7

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Fit an exponential trend $y=ab^x$ to the above data by the method of least squares and find the trend value Estimate the population in 1981.

B. A small project consist of following activities construct a network diagram for project and identity critical path **(5)**

Find (a) Earliest and latest starting and finishing Time

(b) Total Float

(c) Tail slack and head slack

Activity	A	B	C	D	E	F	G	H
P.A	----	A	A	B	B,C	B	D	E,F
Time	8	2	4	2	6	3	1	4

C. By using the method of simple Average determine seasonal indices for a time series **(5)**

Year	I	II	III	IV
1978	10	27	21	40
1979	11	35	29	57
1980	14	51	33	74
1981	19	57	43	78
1982	22	67	45	101