

**TIME : 2 Hrs.**

**MARKS : 60**

N.B. :

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.

Q.1. a) What are the different types of floats ?

(1)

**OR**

a) What is critical path ?

(1)

b) Attempt any two subquestions out of three -

i) What are major limitations of the PERT model ? Discuss.

(7)

ii) A research and development department is developing a new power supply for a console television set. The jobs and their estimated times are given below.

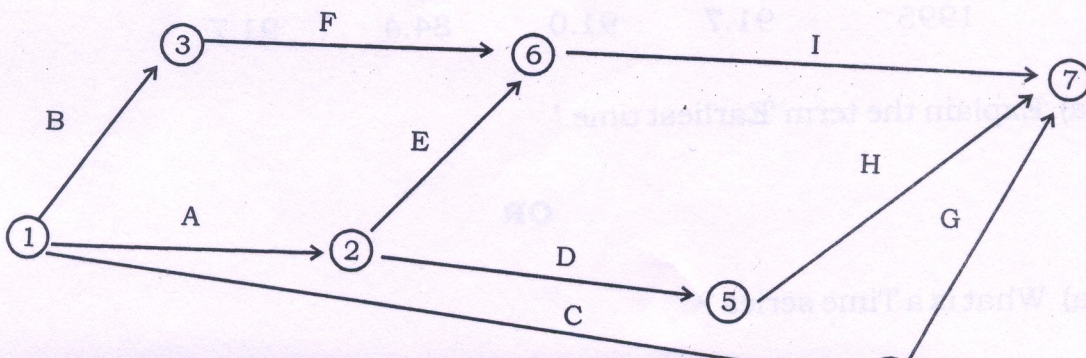
Job	immediate predecessor	Time (days)
A	-	5
B	A	7
C	B	2
D	B	3
E	C	1
F	D	2
G	C	1
H	E, F	3
I	G, H	10

Draw the PERT network. Identify the critical path. Calculate earliest and latest time for each activity. Also find total float.

(7)

iii) A project is represented by the network shown below and has the following data

Task	A	B	C	D	E	F	G	H	I
Optimistic Time	5	18	26	16	15	6	7	7	3
Pessimistic Time	10	22	40	20	25	12	12	9	5
Most likely Time	8	20	33	18	20	9	10	8	4



Determine - expected time and variance for each activity, critical path.  
 What is the probability that the project will be completed in  
 41.5 weeks ?

(7)

Q. 2. a) What is simple random sampling ?

(1)

**OR**

a) What do you understand by 'population' ?

(1)

b) Attempt any two subquestions out of three -

i) Describe various steps in conducting a sample survey.

(7)

ii) Explain the lottery method of selecting a random sample.

(7)

iii) Distinguish between sampling and non-sampling errors.

(7)

Q. 3. a) What are different components of a time series ?

(1)

**OR**

a) Give any one use of Time series analysis.

(1)

b) Attempt any Two subquestions out of three -

i) Describe the moving average method for determining trend.

(7)

ii) Fit a straight line trend for the following data giving crude oil production.

Estimate the figure for year 1999.

(7)

Year	1991	1992	1993	1994	1995	1996	1997
Production (in million tons)	10	16	21	26	29	29	30

iii) Find the seasonal indices

(7)

Year	Quarters			
	I	II	III	IV
1991	106.0	100.4	97.1	105.7
1992	107.2	108.6	107.3	110.5
1993	107.6	100.0	96.5	96.0
1994	91.5	89.1	86.4	94.1
1995	91.7	91.0	84.4	91.7

Q. 4. a) Explain the term 'Earliest time.'

(1)

**OR**

a) What is a Time series ?

(1)

b) Attempt any Two subquestions out of Three -

i) A project schedule has the following characteristics.

Activity	Time	Activity	Time
1-2	4	5-6	4
1-3	1	5-7	8
2-4	1	6-8	1
3-4	1	7-8	2
3-5	6	8-10	5
4-9	5	9-10	7

Draw a network, Obtain the critical path. Calculate Earliest and Latest event time. (7)

- ii) Explain Random number method of selecting a random sample. From a population of 110 units a simple random sample of size 5 is required to be drawn without replacement. Using following random numbers, draw the sample giving reasons :-

Random numbers : 270, 706, 490, 827, 046, 359, 650, 429 (7)

- iii) Calculate 5 yearly moving average for the following data : (7)

Year	:	1996	1997	1998	1999	2000	2001
Sales	:	51	53	50	57	60	55
Year	:	2002	2003	2004	2005		
Sales	:	59	62	68	70		

