OPERATIONS MANAGEMENT

(Major Exam.)

Attempt all questions. Marks are shown in the bracket. It's a closed book exam. Calculators are allowed.

Course Coordinator: Dr. S.P. Singh **Max. Marks: 30**

Batch: B.Tech **Time Allowed:** 2.0 hrs

1. What was the title of your case study? Discuss your case study in detail (*Max. word limit: 2000*). [6] 9

2. A network consists of the following list. Times are given in weeks. [6] 7

Activity	Preceding activities	Duration (weeks)
A	--	9
B	A	2
C	A	12
D	A	5
E	B	6
F	B	8
G	C, F	3
H	D	2
I	H	8
J	G, I	6
K	E, J	2

a) Draw the network diagram using AON and AOA.
b) Which activities form the critical path?
c) How much slack exists at activities A and F?
d) What is the duration of the critical path?

3. A cafeteria serving tea has a counter from which the customers self serve. Arrival follows a Poisson distribution at the rate of four per minute. In self-serving process, customers take about 20 seconds with an exponentially distributed time. [6] 7

a) How many customers will turn up on an average at the tea counter?
b) How long will it take to get a cup of tea?
c) What percentage of time the tea stall is being utilized?
d) What is the probability that at least four customers are in the cafeteria for tea

4. New start-up by group of IIT Delhi students named "*HiTek Computer Services*" repairs & services personal computers at it store, and it makes local service calls in and around IIT Delhi. It primarily uses final year students & PhD students. The new start-up has had steady growth since it started. It purchases generic computer parts in volume at a discount from a variety of sources whenever it sees a good deal. Thus, they need a good forecast of demand for repairs so that they will know how many computer component parts to purchase and stock, and how many technicians to hire. They have accumulated the demand data shown below for repair and services call based on last 12 months. From this data they want to forecast demand considering α=0.3 and α=0.5.

Period	1	2	3	4	5	6	7	8	9	10	11	12
Month	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Demand	37	40	41	37	45	50	43	47	56	52	55	54

Which α value in your opinion should be considered in forecasting? Justify your opinion. [6]

**********End of the paper**********