QP Code:129380 (New Scheme) **Reg. No.:……**

First Year MHA Degree Supplementary Examinations, February 2016

OPERATIONS RESEARCH (2013 Scheme)

Time: 3 Hours **Max Marks: 100**

- **Answer all the questions**
- ***Ordinary calculator can be used***

Essays: **(2x20=40)**

1. "Develop a replacement policy for a 3 years old ventilator over the next 4 years, hospital requires that a 6 years old machine be replaced, the cost of a new machine is $ 10,00,000".

Age (yrs)	Revenue (Rs)	Operating cost (Rs)	Salvage Value
0	20,000	200	-
1	19,000	600	80,000
2	18,500	1200	60,000
3	17,200	1500	50,000
4	15,500	1700	30,000
5	14,000	1800	10,000
6	12,200	2200	5000

2. A manufactures 3 product A,B & C. the profits are Rs. 3, Rs. 2 & Rs. 4 respectively the firm has two machines and given below is the required processing time in minutes for each machine for each product.

Product	A	B	C
Machine G	3	3	5
Machine H	4	2	4

Machine G & H have 2,000 & 2,500 machine minutes respectively. The firm must manufacture 100 A's, 200 B's & 50 C's but not more than 150 A's set up an Lp problem to maximize profit.

Short Essays: **(2x10=20)**

3. Discuss balanced and unbalanced transportation problem. Solve the following transportation problem. Find the initial basic feasible solution by using Voguls solution

		To			Supply
		D	E	F	
From	A	6	8	1	50
	B	3	8	7	40
	C	4	4	2	60
Demand		20	95	35	150

4. Vehicles arrive at a gas filling station at the rate of 3 per hour. The inter-arrival time being distributed as negative exponential. There is one server who attends to the filling of the gas & billing & collecting. The service time is distributed as negative exponential with mean 10 minutes. At a time there is waiting space for only three vehicles and a vehicle that arrives and finds no waiting space drives away and is lost to the system. Find the following:
   Average time spent by a vehicle in the gas filling station. The proportion of vehicles which are lost to the system.

Short notes: **(8x5=40)**

5. Explain different phases in operation research.
6. Scope of network analysis in hospital.
7. Basic properties of LP model.
8. Elements of queuing model.
9. Lead time.
10. "Monte".l.
11. Classic EOQ model.
12. How to determine the critical path.

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