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

First Year MHA Degree Supplementary Examinations, February 2017

OPERATIONS RESEARCH (2013 Scheme)

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

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

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

1. Explain briefly Vogel's approximation method. Show the following transportation problem by application of Vogel's approximation method for optimum solution & optimum cost

	W_1	W_2	W_3	W_4	Supply
F_1	19	30	50	10	07
F_2	70	30	40	60	09
F_3	40	08	70	20	18
Demand	05	08	07	14	34

2. Mention briefly the features of the queuing system.

At a petrol station customer arrive in poison process with an average time of 5 minutes between arrivals. A time interval between services at the petrol pump follow exponential distribution. The mean time tame taken to services a unit is 2 minutes. On the basis of this information answer the following questions

- What would be expected average queue length
- What would be the number of customers in the queue.
- How long on an average a customer does wait in the queue
- How much time on an average a customers does spend in the system
- By how much should the flow of customers be increased to justify for opening of second services point of the management is willing to open, provided the customers has to wait for 5 minutes for the services.

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

3. Discuss on estimation of time in network analysis. What is critical path and its implication on the project.
4. A PHC in a remote area requires 600 liters of drinking. water per week .To place an order to replenish the inventory is Rs.25/-.The transportation cost is Rs. 0.10/liter. This transportation cost increases the cost of water to Rs.1.25/ liter .The holding cost per annum is Rs.2.6/liter based on the frequency calculate the frequency & size of each order

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

5. What is safety stock and its importance.
6. Rules for constructing an project network diagram
7. Application of replacement model in hospital
8. What is inventory and mention its importance
9. Monte carlo simulation model..
10. Difference between PERT and CPM
11. Individual vs group replacement
12. Decision making conditions

****