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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, February/March - 2016

OPERATIONS RESEARCH (Common to ME, MCT, AME, MSNT)

Time: 3 Hours

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Max. Marks: 75

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Answer any Five Questions All Questions Carry Equal Marks

- 1.a) How do you identify the following solution in graphical methods?
 - i) Infeasible solution
 - ii) Unbounded solution
 - b) A company wants to purchase at most 180 units of a product. There are two types of the product, M₁ and M₂ available. M₁ occupies 2 ft³, cost Rs. 12/- and the company makes a profit of Rs. 3/-. M₂ occupies 3ft³, costs Rs. 15/- and the company makes a profit of Rs 4/- If the budget is Rs. 15,000/- and the warehouse has 3000 ft³ for product. Formulate the problem as a linear programming model and solve the problem using simplex method.
- 2. A trip from Hyderabad to Warangal takes 6 hours by bus. A typical time table of bus services in both directions is given below.

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	Route No:	Departure	Arriyal	Route No:	Departure	Arrival
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_	b	/ 07:30 \	13:30	2	09:00	15:00
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The cost of providing this service by the transport company depends upon the time spent by the bus crew (driver and conductor) away from their places in addition to service times. There are five crews. There is a constraint that every crew should be provided with 4 hours of rest before return trip again and should not wait for more than 24 hours for the return trip. The company has residential facilities for the crew at Hyderabad as well as at Warangal. Obtain the pairing of routes so as to minimize the cost.

3.a) Explain the algorithm for sequencing of 2 jobs to process on 'n' machines.

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b) The following mortality rates have been found for a certain type of coal cutter motors

	Weeks	10	20	•	30	40	50	_
Tot	al %failure up to end of 10	5	15		35	65	100	

If the motors are replaced over the week, the total cost is Rs. 200. If they fail during the week the total cost is Rs. 100 per failure. Is it better to replace the motors before failure and if so when.

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