

1. Each question will carry 10 marks

2. Instruction: Solve the numerical problems

Q 7	What is a linear programming model? How do you solve the model using graphical technique?	CO1																																				
Q 8	What do you understand by range of optimality and range of feasibility?	CO2																																				
Q 9	<p>The following are the scores of 21 college students on a statistics test. Construct a frequency distribution table.</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>75</td> <td>52</td> <td>80</td> <td>96</td> <td>65</td> <td>79</td> <td>71</td> </tr> <tr> <td>69</td> <td>72</td> <td>81</td> <td>71</td> <td>76</td> <td>86</td> <td>79</td> </tr> <tr> <td>83</td> <td>84</td> <td>77</td> <td>64</td> <td>71</td> <td>87</td> <td>72</td> </tr> </table>	75	52	80	96	65	79	71	69	72	81	71	76	86	79	83	84	77	64	71	87	72	CO4															
75	52	80	96	65	79	71																																
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Q 10	<p>A department of a company has five employees with five jobs to be performed. The time in hours that each man takes to perform each job is given in the effectiveness matrix.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Jobs/Employees</th> <th>I</th> <th>II</th> <th>III</th> <th>IV</th> <th>V</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>60</td> <td>50</td> <td>100</td> <td>85</td> <td>95</td> </tr> <tr> <td>B</td> <td>65</td> <td>45</td> <td>100</td> <td>75</td> <td>90</td> </tr> <tr> <td>C</td> <td>70</td> <td>60</td> <td>110</td> <td>97</td> <td>85</td> </tr> <tr> <td>D</td> <td>70</td> <td>55</td> <td>105</td> <td>90</td> <td>93</td> </tr> <tr> <td>E</td> <td>60</td> <td>40</td> <td>120</td> <td>85</td> <td>97</td> </tr> </tbody> </table> <p>How should the jobs be allocated, one per employee, so as to minimize the total man hours?</p>	Jobs/Employees	I	II	III	IV	V	A	60	50	100	85	95	B	65	45	100	75	90	C	70	60	110	97	85	D	70	55	105	90	93	E	60	40	120	85	97	CO3
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Q 11	<p>Use graphical model to solve the following LP problem</p> <p>Minimize $Z = 600x_1 + 400x_2$</p> <p>Subject to the constraints</p> <p>i) $3x_1 + 3x_2 \geq 40$</p> <p>ii) $3x_1 + x_2 \geq 40$</p> <p>iii) $2x_1 + 5x_2 \geq 44$</p> <p>and $x_1, x_2 \geq 0$</p>	CO2																																				
Section C																																						
<p>1. Each Question carries 20 Marks.</p> <p>2. Instruction: Answer any one question from the analytical questions</p>																																						
Q 12	1. Determine the initial basic feasible solution to the following transportation problem by using a) NWCR, b) LCM and c) VAM. Which method gives best results?	CO4																																				

	D1	D2	D3	D4	Supply
S1	21	16	15	3	11
S2	17	18	14	23	13
S3	32	27	18	41	19
Demand	6	10	12	15	

OR

2. A diet for a sick person must contain at least 2000 units of vitamins, 50 units of minerals and 1400 calories. Two foods A and B are available at the cost of Rs. 3 and Rs. 5 per unit, respectively. If one unit of A contains 200 units of vitamins, 1 unit of mineral and 40 calories and one unit of food B contains 80 units of vitamins and 40 calories, find what combination of foods be used to have least cost?