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Jaypee Institute of Information Technology Noida
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B.Tech III Sem

Course Title: Managerial Economics
Course Code: 10B11PD311

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Maximum Time: 1 Hr
Maximum Marks: 20

- Given the two factor production function: $Q = 150L^{0.5}K^{0.5}$, wage rate of labor = Rs 50 and rental cost of capital = Rs 40. Determine amounts of labour and capital that will minimize the cost of producing 1118 units of output. 2
- The following table relates to the price of a top-up mobile service provider and its demand (in thousands) in NCR region. Forecast demand for the mobile service for the sixth year by using: 5
(a) Three period moving average method (b) Exponential Smoothing Method with $w = 0.7$
Also comment which methods provide more accurate forecasting

Price	100	150	200	300	400
Demand	20	18	15	12	5

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- Based on the below data, following information is available for sales and profits (in Lakhs) of an organization. The least square regression line is estimated to be $Y = 1.71 + 0.201X$ and $\sum(Y_i - \hat{Y})^2 = 2.135$. Calculate t statistics and comment on the result. Refer to the t table given at the end 3
confidence level = 95%

Sales	7	2	6	4	14	15	16	12
Profit	3	2	2.5	3	5	5.5	4	4

- As part of the restructuring plan Mitsubishi conducts an analysis of how labour and capital are used in its production process. Prior to restructuring, the company's Marginal rate of technical substitution was 0.15. To hire workers suppose that Mitsubishi must pay the competitive hourly wage of \$ 1330 and determines that its marginal productivity of capital is 0.5 small cars per hour at its new targeted level of output. Their analysis also indicates that average selling price of the car is \$ 9.5 lakhs. Determine the rate at which Mitsubishi can rent capital and the marginal productivity of labour at its new targeted level of output. To minimize cost, what should be the value of MRTS. 2
- In a perfectly competitive market, the market demand is given as $P = 100 - 4Q_d$ and market supply is given as $P = Q_s$. Denoting firm level quantity by 'q', assume Total cost function of an individual firm as $TC = 50 + 4q + 2q^2$. Calculate and compare the short run and long run equilibrium in terms of: 5
(a) Price and quantity (b) No. of firms (c) Profit
 Q_d & Q_s are in 1000 units
- State true or false and give appropriate reason. 5
(a) The shape of Average Fixed Cost (AFC) is always a straight line parallel to x axis.
(b) Delphi is the only qualitative forecasting method available for organizations.
(c) The output elasticity is equal to 0.52 when $MP_L = 10 - 0.02L$ and $L = 100$.

Table 1

t distribution critical values

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df	Upper-tail probability p											
	.25	.20	.15	.10	.05	.025	.02	.01	.005	.0025	.001	.0005
1	1.000	1.376	1.963	3.078	6.314	12.71	15.89	31.82	63.66	127.3	318.3	636.6
2	0.816	1.061	1.386	1.886	2.920	4.303	4.849	6.965	9.925	14.09	22.33	31.60
3	0.765	0.978	1.250	1.638	2.353	3.182	3.482	4.541	5.841	7.453	10.21	12.92
4	0.741	0.941	1.190	1.533	2.132	2.776	2.999	3.747	4.604	5.598	7.173	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	2.757	3.365	4.032	4.773	5.893	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	2.612	3.143	3.707	4.317	5.208	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.517	2.998	3.499	4.029	4.785	5.408