DOON UNIVERSITY, DEHRADUN
Semester Final Examination, odd Semester, 2015
School of social science
M.sc. (Economics) 3rd Sem
Course: SSEI 214-mathmatics 3

Time Allowed: 3Hours   *Maximum Marks: 50*

Q.1 :- A manufacturing company is engaged in producing three type of products A,B and C. The production department produces each day, Component sufficient to make 50 units of A, 25 Units of B and 30 units of C. The management is confronted with the problem of optimizing the daily production of products in assembly department where only 100 man hour are available daily to assemble the products. The following additional information is available: (8 marks)

Type of product	Profit contribution of per unit of product (rs)	Assembly time per product (hrs)
A	12	.8
B	20	1.7
C	45	2.5

The company has the daily order commitment for 20 units of product A and total of 15 units of product B & C. formulate this problem as an LP Model so as to maximize he total profit.

or

Q.1:- Two breakfast food manufacturers, ABC & XYZ are competing for an increased market share. The payoff matrix shown in the following table, describe the increases in the market share for ABC and decreases for XYZ   (8 marks)

ABC	XYZ			
	Give coupons	Decrease prices	Maintain present strategy	Increase advertisement
Give coupons	2	-2	4	1
Decrease prices	6	1	12	3
Maintain present strategy	-3	2	0	6
Increase advertisement	2	-3	7	1

Determine the optimal strategy for both the manufacturers and the value of the game.

Q.2:- write short notes _____ (10 marks)

- Stochastic simulation and random numbers
- Method of generating random number and use of random number to forest any business activity.

Or

Q. 2:- Explain the Maclaurian and taylor series of a polynomial function at zero and other than zero point. (10 marks)

Q.3:- A factory produces 150 scooters. But the production rate varies with the distribution depicted as in following table _____ (6 marks)

Production rate	147	148	149	150	151	152	153
probability	.05	.10	.15	.20	.30	.15	.05

At present the truck will hold 150 scooters. Using the following random number determine the average number of scooter waiting for shipment in the factory and average number of empty space in the truck. Random numbers are – 82, 54, 50, 96, 85, 34, 30, 02, 64, 47.

Or

Q. 3:- Use Jacobian determinants to test the existence of functional dependence between the paired function: (6 marks)

- $Y1 = 3X1^2 + X2$ & $Y2 = 9X1 + 6X1^2(X2 + 4) + X2(X2 + 8) + 12$

Q.4- let the equilibrium condition for national income be (8 marks)

$S(Y) + T(Y) = I(Y) + G0 \ (S', T', I' > 0 : S' + T' > I')$

Where S, Y, T, I and G stand for saving, national income, taxes, investment and government expenditure respectively. All derivatives are continuous.

a) Interpret the economic meaning of the derivatives S', T' and I'.
b) Check whether the jacobian determinant condition for implicit function is satisfy if yes then find out the equilibrium identity.
c) Find the (dY*/dG0) and discuss its economics implications.

or

Q.4:- Explain the quasi concavity and quasi convexity with geometrical and algebraic characterization. (8 marks)

Q.5:- explain domer growth model with the optimization of investment. (8 marks)

Q.5:- show that the result I(t) = I(0) $e^{\rho st}$ can be obtained alternatively by finding an equating the definit integral of both side of $\frac{1}{I}\frac{dI}{dt}=\rho s$ with respect to t with limit of integration t=0 and t=t

Q. 6:- write short note on the following   (10 marks)

- Comparative analysis and its limitation
- Dynamic analysis and its limitation.

Or

Q.6:- attempt the following   (10 marks)

A) How to find eigenvalues explain with example   (5 marks)

B) find the real eigen values and associated eigen vectors (5 marks)

$$A = \begin{matrix} 0 & 0 & 6 \\ 1/2 & 0 & 0 \\ 0 & 1/3 & 0 \end{matrix}$$