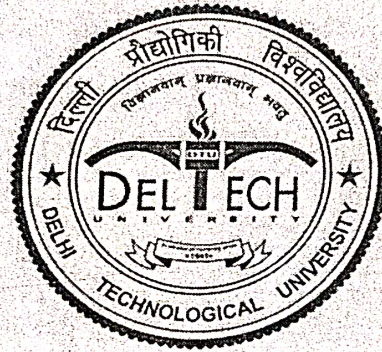


**QUESTION PAPERS  
END TERM EXAMINATION  
MAY- 2019  
(EAST DELHI CAMPUS)**



**MBA, MBA (Business Analytics)  
Ph.D, BBA and BA (H) ECONOMICS  
2<sup>nd</sup> & 4<sup>th</sup> SEMESTER**

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(EAST DELHI CAMPUS)

QUESTION PAPERS FOR MBA, MBA (Business Analytics) Ph.D,  
BBA&BA (H) ECONOMICS END TERM EXAMINATION MAY - 2019

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The government wants to increase income i.e. Y by Rs 1,000 crore. Explain the three policy options available with the government to achieve this objective. Explain the significance of each of these options in terms of their effectiveness and impact on government budget. [10]  
[b] Explain the concept of automatic stabiliser with suitable example. [5]

Q.7 [a] Explain the determination of equilibrium interest rate using the money demand-money supply framework. [7]  
[b] Explain the crowding-out effect using suitable diagram. Explain how the fiscal expansion can be accommodated using monetary policy. [8]

Total No. of Pages: 4

Roll No.....

II SEMESTER

BBA

END SEMESTER EXAMINATION May/June-2019

BBA 111: Business Environment

Time: 3:00 Hours

Max. Marks : 75

**Note :** 1. This paper contains 3 sections. All the sections are compulsory.  
2. All questions within each section are to be answered in a continuous manner on the answer sheet.  
3. Internal choice is given in Section B and Section C.

#### SECTION A

Q.1 Read the case study given below and answer the questions that follow. [15]

Le Sportif is a health and sports club located in Paris. The club has performed well over the last two years but now faces competition from two clubs, Wellness and Glides, which have just opened. Wellness has been particularly successful as it has housed several technologically advanced sports and health equipment and has attracted a large number of customers from Le Sportif. Meanwhile, Glides is the only club in the area that is also offering swimming pool facility.

The management of Le Sportif conducted some extensive market research to find out more information about their customers. They interviewed a few of the club's customers to find out their views on Le Sportif and gave them a questionnaire to seek more precise information about the way the customers used their club.

Le Sportif has responded positively to its market research by adopting the following strategies:

- Introducing a family membership scheme
- Introducing a range of family-based classes to encourage health and fitness
- Opening a coffee shop

The management of Le Sportif believes that this new customer-oriented approach, which targets health and fitness for the whole family, will give the club a unique selling point and enable it to stand out from the competition.

- [a] What are some of the key questions which Le Sportif may have asked from its customers during the survey? [3]
- [b] Le Sportif is facing intense competition from new clubs in the market. Do you think that the threat of new entry is high in the health and fitness industry? Give reasons in support of your answer. [3]
- [c] Analyse the intensity of buyer power and threat of substitutes in this industry. [3+3]
- [d] Conduct a SWOT analysis of Le Sportif. [3]

#### SECTION B

Attempt any two questions. Each question carries 15 marks.

- Q.2 [a] "Low inflation may be associated with weaknesses in the economy." Do you agree? Give reasons in support of your answer. [7]
- [b] Explain how is the business environment of a country impacted by the proportion of people in different age groups, i.e. 0-14, 15-59 and 60 & above? [8]

Q.3 [a] "The Insolvency and Bankruptcy Code, 2016 (IBC) is a welcome overhaul of the existing framework for resolving corporate and individual insolvencies and bankruptcies." In the light of this statement, explain the

two stages of insolvency resolution as mentioned in the code. What are some of the recent cases of bankruptcy which have been initiated under this law? [7]

[b] Briefly explain the key functions of the Competition Commission of India. [8]

Q.4 [a] How does the natural environment impact the business operations of an industry? [7]

[b] What are the scope and objectives of monetary policy? Briefly explain the monetary policy instruments used by the central banks to control money supply and interest rates. [8]

#### SECTION C

Attempt any two questions. Each question carries 15 marks.

Q.5 [a] Explain the determination of savings function from consumption function in a 2-sector model using a suitable diagram. [5]

[b] Assume the following for the economy of a country:

Consumption function:  $C = 85 + 0.5Y_d$

Investment function:  $I = 85$

Government spending:  $G = 60$

Net taxes:  $T = -40 + 0.25Y$

Disposable income:  $Y_d = Y - T$

Solve for equilibrium income. How much does the government collect in net taxes when the economy is in equilibrium? What is the government's budget deficit or surplus? [10]

Q.6 [a] Consider the following three-sector model:

$C = \bar{C} + 0.6Y_d$ , where  $Y_d$  is the disposable income

$G = \bar{G}$ ;  $I = \bar{I}$  and  $T = \bar{T}$



Total No. of Pages 34

2<sup>nd</sup> SEMESTER

BBA

END SEMESTER EXAMINATION

May/June-2019

PAPER CODE BBA-112

BUSINESS STATISTICS AND OPERATIONS RESEARCH

Time: 3:00 Hours

Max. Marks: 75

Q.6 (b) Explain Transportation Problem (TP) and various method to find out initial feasible and optimal solution and also find the initial feasible solution using Vogel Approximation Method (VAM) for the following problem.

Origin	Destination				Total si
	1	2	3	4	
1	19	30	50	10	7
2	70	30	40	60	9
3	40	8	70	20	18
Total d <sub>j</sub>	5	8	7	14	34

Q.7 Solve the following LPP using simplex method

$$\text{Maximize } z = 3X_1 - X_2$$

$$2X_1 + X_2 \leq 2$$

Subject to  $X_1 + 3X_2 \geq 3$

$$X_2 \leq 4$$

$$X_1, X_2 \geq 0$$

Note: Answer any five question. Question no 1 is compulsory.

All questions carry equal marks.

Assume suitable missing data, if any.

Simple calculator is allowed.

Q.1 Define the following terms with examples (Any Five)

(i) Lorenz Curve

(ii) Inter-Quartile Range (IQR)

(iii) Duality and its Significance

(iv) Feasible Solution, Basic Feasible Solution & Optimal Solution

(v) Spearman Rank Correlation Co-efficient

(vi) Coefficient of Determination and Correlation

Q.2 (a) A small plant manufactures two models of a product, say A & B. Two resources R1 & R2, are required for the manufacturing of units of this product. One unit of A consumes 10 units of R1 and 15 units of R2. Similarly one unit of B consumes 12 units of R1 & 17 units of R2. Suppose further that the company has 800 units of R1 & 600 units of R2 available per week, and each unit of A & B gives a profit of Rs. 50 & Rs. 70 respectively. Formulate this as a linear programming problem (LPP) and find the optimal weekly production levels for these two models using graphical method.

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(b) The Following table gives the distribution of the monthly income of 600 families in a certain city:

Monthly Income('00Rs)	Below 75	75-150	150-225	225-300	300-375	375-450	450 & above
No. of families	60	170	200	60	50	40	20

Draw a 'less than' & a 'more than' Ogive curve for the above data and on the same graph depict and find the median income.

Q.3 (a) The average daily wage of all workers in a factory is Rs.444. if the average daily wages paid to male and female workers are Rs 480 & Rs 360 respectively, find the percentage of male & female workers employed by the factory.

(b) Calculate the standard deviation from the following table and also show that S.D is independent of change of origin:

Age (in years)	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of members	3	61	132	153	140	51	2

Q.4 (a) Calculate the coefficient of correlation for the following heights (in inches) of fathers(X) & their sons(Y) and comment on the result:

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

(b) Explain Scheduling & its rules, Also construct a Gantt Chart for the following data and also obtain idle time for machine A and B :

Machine	Job timings data in number of days				
	Job 1	Job 2	Job 3	Job 4	Job 5
A	5	3	2	4	7
B	7	6	8	9	5

Q.5 (a) The following table gives the ages & blood pressure of 10 women.

Age(X)	56	42	36	47	49	42	60	72	63	55
Blood Pressure	147	125	118	128	145	140	155	160	149	150

- Find the regression coefficients & correlation coefficient and comment on the result.
- Determine the least square regression equation of Y on X
- Estimate the blood pressure of women whose age is 45 years.

(b) Define Operations Research & Business Statistics, Also explain their applications in business.

Q.6 (a) Formulate the following Assignment Problem (AP) as LPP model and also find the optimal assignment of the problem:

	I	II	III	IV
A	10	5	13	15
B	3	9	18	13
C	10	7	2	2
D	7	11	9	7



Total No. of Pages 2  
II SEMESTER

Roll No.....  
BBA

END SEMESTER EXAMINATION **May/June-2019**

PAPER CODE BBA 113 TITLE OF PAPER- Business Law

Time: 3:00 Hours Max. Marks : 75

Note : Q.1. is compulsory. Attempt any four out of the remaining questions.  
All questions carry equal marks.

- Q.1. Discuss the legal implications involved in the following cases ( any five ) -
- A. A draws a cheque in favour of B, a minor. B endorses it in favour of C, who in turn endorses it in favour of D. The cheque is dishonoured by the bank. Discuss the rights of C and D.
  - B. Soda-water was supplied by P to R in bottles. R was injured by the bursting of one of the bottles. Can R claim damages from P?
  - C. X sells goods to Y. Y pays through a cheque. Before Y could obtain the delivery of goods, his cheque has been dishonoured by the Bank. X, therefore refuses to give delivery of the goods until paid. Is X's action justified?
  - D. M, who is trying to sell an unsound horse, forges a veterinary surgeon's certificate stating that the horse is sound and pins it on the stable door. S comes to examine the horse but the certificate goes unnoticed by him. He buys the horse and later on finds that the horse is unsound. He wants to avoid the agreement under the plea that he has been defrauded. Will he succeed?
  - E. X, an agent refused to hand over the account books of Y, the principal to the new agent appointed in his place unless the principal released him from all the liabilities. The principal had to give a release deed as demanded. Is this release deed binding upon the principal?
  - F. X asks Y to beat Z and promises to indemnify Y against consequences. Y beats Z and is fined ₹ 1000. Can Y claim ₹1000 from X?



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G. X delivered some cattle to Y for feeding grass in Y's farmhouse against some payment. Without any negligence on Y's part, a cattle is stolen. Y did not inform X or the police or make any effort to recover the cattle because he thought it would be useless to do so. Who is liable and why?

Q.2. (1) Explain the term "consideration" and state the exceptions to the rule "no consideration, no contract".

(2) Define offer and acceptance. When communication of offer and acceptance is deemed to be complete if made through post?

Q.3. (1) Define bailment and briefly state the rights and duties of bailor and bailee.

(2) What are the rights and obligations of a finder of goods?

Q.4. (1) Define unpaid seller. What are his rights under the Sale of Goods Act?

(2) "A seller cannot convey a better title to the buyer than he himself has." Discuss this rule of law and point out the exceptions.

Q.5. Distinguish between the following-

i) Sale and Agreement to Sell

ii) Memorandum of Association and Articles of Association

iii) Coercion and Undue Influence

iv) Bills of exchange and Promissory Note

v) Bailment and Pledge

Q.6. (1) Define Company. What are the various types of companies as per Companies Act 2013?

(2) What are the provisions with respect to the appointment of Directors in Companies Act 2013?

Q.7. (1) Distinguish between a "holder" and a "holder in due course". Explain fully the privileges granted to a "holder in due course" under Negotiable Instruments Act.

(2) What is an endorsement? Explain and illustrate the different kinds of endorsement.



—100—

Total No. of Pages \_\_\_\_\_

Roll No. ....

2<sup>ND</sup> SEMESTER

BBA

May/June-2019

**END SEMESTER EXAMINATION**

**PAPER CODE 115**

**Subject: Business Communication**

*Time: 3:00 Hours*

*Max. Marks: 75*

Note : Answer all question by Selecting any two parts from each questions.  
All questions carry equal marks.  
Assume suitable missing data, if any.

(15 Marks)

- Q.1[a] Explain the purpose/Objective of giving a Presentation highlighting the steps involved in planning a presentation?
- [b] Discuss the guidelines for writing the job application letter in detail?
- [c] Enumerate the benefits the modern technology has to offer and the issues involved with the use of technology faced by global managers?

(15 Marks)

- Q.2[a] Discuss the features of a good report writing and the common mistakes in report writing?
- [b] Discuss the process of Business communication and the relevance of 7c's of communication in making it more effective?
- [c] Explain the AIDA Principle in detail?

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### SECTION B

Attempt any two questions. Each question carries 15 marks.

Q.3 [a] The office manager at a real estate firm makes a pot of coffee every morning. The time before it runs out,  $Y$ , in hours depends on the number of persons working on that day ( $X$ ). Suppose that the data from the last six days is: [5]

X	1	2	3	3	4	5
Y	8	4	5	3	3	1

- Obtain the regression equation of  $Y$  on  $X$  and interpret your result.
- Calculate the coefficient of determination for the regression and interpret it.

[b] Prove the following results: [5]

- The product of the two regression coefficients ( $b_{yx}$  and  $b_{xy}$ ) is  $r^2$ .
- The mean value of the residuals  $\hat{u}_i$  is zero.

[c] For 50 students of a class, the regression equation of marks in Statistics ( $X$ ) on the marks in Accountancy ( $Y$ ) is  $3Y - 5X + 180 = 0$ . The mean marks in Accountancy is 44 and the variance of marks in Statistics is  $9/16$  of the variance of marks in Accountancy. Find the mean marks in Statistics and the coefficient of correlation between marks in the two subjects. [5]

Q.4 [a] Prove that under the assumptions of CLRM, the OLS estimator  $\widehat{\beta}_2$  is the best linear, unbiased and efficient (BLUE) estimator of  $\beta_2$ . [10]

[b] From a sample of 20 firms, the following regression results are obtained:



$$\widehat{\text{salary}} = 4.32 + 0.280 \text{ sales} + 0.0174 \text{ roe} + 0.00024 \text{ ros}$$

$$\text{Standard error} = (0.32) \quad (0.035) \quad (0.0041) \quad (0.00054)$$

$$R^2 = 0.283$$

Where salary = salary of CEO

sales = annual firm sales

roe = return on equity

ros = return on firm's stock

- (i) Interpret the regression equation. [1]
- (ii) Which of the coefficients are individually statistically significant at the 5% level? [2]
- (iii) Test the overall significance of the regression at 5% level. [2]

Q.5 [a] Consider the data given below: [10]

$$\sum x_2^2 = 12; \sum x_2 x_3 = 8; \sum x_3^2 = 12; \sum y x_2 = 10; \sum y^2 = 10; \sum y x_3 = 8 \text{ and } n = 23$$

Compute:

$\widehat{\beta}_2, \widehat{\beta}_3, R^2$ , standard errors of  $\widehat{\beta}_2, \widehat{\beta}_3$  and covariance  $(\widehat{\beta}_2, \widehat{\beta}_3)$ .

[b] What is Adjusted  $R^2$ ? What are the key features of adjusted  $R^2$ ? [5]

### SECTION C

**Attempt any two questions. Each question carries 15 marks.**

Q.6 [a] What are the sources of multicollinearity in a regression model? Explain any three ways to detect multicollinearity. [2+3]

[b] Explain why the regression coefficients are indeterminate in the case of perfect multicollinearity. [5]

[c] From the annual data for the US manufacturing sector for 1899-1922, the following regression results were obtained:

**Regression A**

$$\widehat{\log Y} = 2.81 - 0.53 \log K + 0.91 \log L$$

$$\text{s.e.} = (1.38) \quad (0.34) \quad (0.14)$$

$$R^2 = 0.97$$

$$F = 189.8$$

Where  $Y$  = real output,  $K$  = real capital input,  $L$  = real labour input

**Regression B**

$$\widehat{\log(Y/L)} = -0.11 + 0.11 \log(K/L)$$

$$\text{s.e.} = (0.03) \quad (0.015)$$

$$R^2 = 0.65$$

$$F = 19.5$$

- (i) Is there multicollinearity in regression A? How do you know? [2]
- (ii) If there was multicollinearity in regression A, has that been reduced by regression B? How do you know? [2]
- (iii) Are the  $R^2$  values of the two regressions comparable? Why or why not? [1]

Q.7 [a] What are the reasons behind the presence of heteroscedasticity in a regression model? What are the consequences of estimating OLS parameters in the presence of heteroscedasticity? [3+2]

[b] Explain using suitable example how Park Test can be used to detect heteroscedasticity in a model. [5]

[c] Consider the following model:

$$C_t = \beta_1 + \beta_2 GNP_t + \beta_3 D_t + u_t$$

Where  $C_t$  = aggregate private consumption expenditure in year  $t$ ,  $GNP_t$  = gross national product in year  $t$  and  $D_t$  = national defence expenditure in year  $t$ . It is suspected that the model suffers from the problem of



heteroscedasticity. Assuming that  $\sigma_t^2 = \sigma^2 GNP_t^2$ , show how can the model be transformed to make it homoscedastic. [5]

Q.8 [a] What is autocorrelation? Explain how does model specification error lead to the problem of autocorrelation. [2+3]

[b] What are the consequences of OLS estimation in the presence of autocorrelation? Explain the graphical method of detecting autocorrelation in a regression model. [3+2]

[c] Use the Durbin-Watson d-test to check for the presence of Autocorrelation in models A and B: [5]

**Model A:**

$$\hat{Y}_t = 0.4529 - 0.0041t$$

$$R^2 = 0.5284$$

$$d = 0.8252$$

$$n = 16$$

**Model B:**

$$\hat{Y}_t = 0.4786 - 0.0127t + 0.0005t^2$$

$$R^2 = 0.6629$$

$$d = 1.82$$

$$n = 16$$

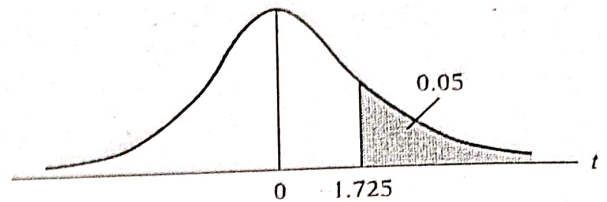


**TABLE D.2**  
Percentage Points of  
the *t* Distribution

Source: From E. S. Pearson and H. O. Hartley, eds., *Biometrika Tables for Statisticians*, vol. 1, 3d ed., table 12, Cambridge University Press, New York, 1966. Reproduced by permission of the editors and trustees of *Biometrika*.

**Example**

$\Pr(t > 2.086) = 0.025$   
 $\Pr(t > 1.725) = 0.05$  for  $df = 20$   
 $\Pr(|t| > 1.725) = 0.10$



Pr df	0.25 0.50	0.10 0.20	0.05 0.10	0.025 0.05	0.01 0.02	0.005 0.010	0.001 0.002
1	1.000	3.078	6.314	12.706	31.821	63.657	318.31
2	0.816	1.886	2.920	4.303	6.965	9.925	22.327
3	0.765	1.638	2.353	3.182	4.541	5.841	10.214
4	0.741	1.533	2.132	2.776	3.747	4.604	7.173
5	0.727	1.476	2.015	2.571	3.365	4.032	5.893
6	0.718	1.440	1.943	2.447	3.143	3.707	5.208
7	0.711	1.415	1.895	2.365	2.998	3.499	4.785
8	0.706	1.397	1.860	2.306	2.896	3.355	4.501
9	0.703	1.383	1.833	2.262	2.821	3.250	4.297
10	0.700	1.372	1.812	2.228	2.764	3.169	4.144
11	0.697	1.363	1.796	2.201	2.718	3.106	4.025
12	0.695	1.356	1.782	2.179	2.681	3.055	3.930
13	0.694	1.350	1.771	2.160	2.650	3.012	3.852
14	0.692	1.345	1.761	2.145	2.624	2.977	3.787
15	0.691	1.341	1.753	2.131	2.602	2.947	3.733
16	0.690	1.337	1.746	2.120	2.583	2.921	3.686
17	0.689	1.333	1.740	2.110	2.567	2.898	3.646
18	0.688	1.330	1.734	2.101	2.552	2.878	3.610
19	0.688	1.328	1.729	2.093	2.539	2.861	3.579
20	0.687	1.325	1.725	2.086	2.528	2.845	3.552
21	0.686	1.323	1.721	2.080	2.518	2.831	3.527
22	0.686	1.321	1.717	2.074	2.508	2.819	3.505
23	0.685	1.319	1.714	2.069	2.500	2.807	3.485
24	0.685	1.318	1.711	2.064	2.492	2.797	3.467
25	0.684	1.316	1.708	2.060	2.485	2.787	3.450
26	0.684	1.315	1.706	2.056	2.479	2.779	3.435
27	0.684	1.314	1.703	2.052	2.473	2.771	3.421
28	0.683	1.313	1.701	2.048	2.467	2.763	3.408
29	0.683	1.311	1.699	2.045	2.462	2.756	3.396
30	0.683	1.310	1.697	2.042	2.457	2.750	3.385
40	0.681	1.303	1.684	2.021	2.423	2.704	3.307
60	0.679	1.296	1.671	2.000	2.390	2.660	3.232
120	0.677	1.289	1.658	1.980	2.358	2.617	3.160
∞	0.674	1.282	1.645	1.960	2.326	2.576	3.090

Note: The smaller probability shown at the head of each column is the area under the curve to the right of the value in the row.



TABLE D.3 Upper Percentage Points of the F Distribution (Continued)

df for denominator $N_2$	df for numerator $N_1$												
	Pr	1	2	3	4	5	6	7	8	9	10	11	12
10	.25	1.49	1.60	1.60	1.59	1.59	1.58	1.57	1.56	1.56	1.55	1.55	1.54
	.10	3.29	2.92	2.73	2.61	2.52	2.46	2.41	2.38	2.35	2.32	2.30	2.28
	.05	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.94	2.91
	.01	10.0	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94	4.85	4.77	4.71
11	.25	1.47	1.58	1.58	1.57	1.56	1.55	1.54	1.53	1.53	1.52	1.52	1.51
	.10	3.23	2.86	2.66	2.54	2.45	2.39	2.34	2.30	2.27	2.25	2.23	2.21
	.05	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.82	2.79
	.01	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63	4.54	4.46	4.40
12	.25	1.46	1.56	1.56	1.55	1.54	1.53	1.52	1.51	1.51	1.50	1.50	1.49
	.10	3.18	2.81	2.61	2.48	2.39	2.33	2.28	2.24	2.21	2.19	2.17	2.15
	.05	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.72	2.69
	.01	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39	4.30	4.22	4.16
13	.25	1.45	1.55	1.55	1.53	1.52	1.51	1.50	1.49	1.49	1.48	1.47	1.47
	.10	3.14	2.76	2.56	2.43	2.35	2.28	2.23	2.20	2.16	2.14	2.12	2.10
	.05	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.63	2.60
	.01	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19	4.10	4.02	3.96
14	.25	1.44	1.53	1.53	1.52	1.51	1.50	1.49	1.48	1.47	1.46	1.46	1.45
	.10	3.10	2.73	2.52	2.39	2.31	2.24	2.19	2.15	2.12	2.10	2.08	2.05
	.05	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.57	2.53
	.01	8.86	6.51	5.56	5.04	4.69	4.46	4.28	4.14	4.03	3.94	3.86	3.80
15	.25	1.43	1.52	1.52	1.51	1.49	1.48	1.47	1.46	1.46	1.45	1.44	1.44
	.10	3.07	2.70	2.49	2.36	2.27	2.21	2.16	2.12	2.09	2.06	2.04	2.02
	.05	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.51	2.48
	.01	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89	3.80	3.73	3.67
16	.25	1.42	1.51	1.51	1.50	1.48	1.47	1.46	1.45	1.44	1.44	1.44	1.43
	.10	3.05	2.67	2.46	2.33	2.24	2.18	2.13	2.09	2.06	2.03	2.01	1.99
	.05	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.46	2.42
	.01	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78	3.69	3.62	3.55
17	.25	1.42	1.51	1.50	1.49	1.47	1.46	1.45	1.44	1.43	1.43	1.42	1.41
	.10	3.03	2.64	2.44	2.31	2.22	2.15	2.10	2.06	2.03	2.00	1.98	1.96
	.05	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.41	2.38
	.01	8.40	6.11	5.18	4.67	4.34	4.10	3.93	3.79	3.68	3.59	3.52	3.46
18	.25	1.41	1.50	1.49	1.48	1.46	1.45	1.44	1.43	1.42	1.42	1.41	1.40
	.10	3.01	2.62	2.42	2.29	2.20	2.13	2.08	2.04	2.00	1.98	1.96	1.93
	.05	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.37	2.34
	.01	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60	3.51	3.43	3.37
19	.25	1.41	1.49	1.49	1.47	1.46	1.44	1.43	1.42	1.41	1.41	1.40	1.40
	.10	2.99	2.61	2.40	2.27	2.18	2.11	2.06	2.02	1.98	1.96	1.94	1.91
	.05	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.34	2.31
	.01	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52	3.43	3.36	3.30
20	.25	1.40	1.49	1.48	1.46	1.45	1.44	1.43	1.42	1.41	1.40	1.39	1.39
	.10	2.97	2.59	2.38	2.25	2.16	2.09	2.04	2.00	1.96	1.94	1.92	1.89
	.05	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.31	2.28
	.01	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46	3.37	3.29	3.23



TABLE D.5A Durbin-Watson  $d$  Statistic: Significance Points of  $d_L$  and  $d_U$  at 0.05 Level of Significance

n	k=1		k=2		k=3		k=4		k=5		k=6		k=7		k=8		k=9		k=10	
	$d_L$	$d_U$	$d_L$	$d_U$	$d_L$	$d_U$	$d_L$	$d_U$	$d_L$	$d_U$	$d_L$	$d_U$	$d_L$	$d_U$	$d_L$	$d_U$	$d_L$	$d_U$	$d_L$	$d_U$
6	0.610	1.400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7	0.700	1.356	0.467	1.896	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8	0.763	1.332	0.559	1.777	0.368	2.287	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9	0.824	1.320	0.629	1.699	0.455	2.128	0.296	2.588	—	—	—	—	—	—	—	—	—	—	—	—
10	0.879	1.320	0.697	1.641	0.525	2.016	0.376	2.414	0.243	2.822	—	—	—	—	—	—	—	—	—	—
11	0.927	1.324	0.658	1.604	0.595	1.928	0.444	2.283	0.316	2.645	0.203	3.005	—	—	—	—	—	—	—	—
12	0.971	1.331	0.812	1.579	0.658	1.864	0.512	2.177	0.379	2.506	0.268	2.832	0.171	3.149	—	—	—	—	—	—
13	1.010	1.340	0.861	1.562	0.715	1.816	0.574	2.094	0.415	2.390	0.328	2.692	0.230	2.985	0.147	3.266	—	—	—	—
14	1.045	1.350	0.905	1.551	0.767	1.779	0.632	2.030	0.505	2.296	0.389	2.572	0.286	2.848	0.200	3.111	0.127	3.360	—	—
15	1.077	1.361	0.946	1.543	0.814	1.750	0.685	1.977	0.562	2.220	0.447	2.472	0.343	2.727	0.251	2.979	0.175	3.216	0.111	3.438
16	1.106	1.371	0.982	1.539	0.857	1.728	0.734	1.935	0.615	2.157	0.502	2.388	0.398	2.624	0.304	2.860	0.222	3.090	0.155	3.304
17	1.133	1.381	1.015	1.536	0.897	1.710	0.779	1.900	0.664	2.104	0.554	2.318	0.451	2.537	0.356	2.757	0.272	2.975	0.198	3.184
18	1.158	1.391	1.046	1.535	0.933	1.696	0.820	1.872	0.710	2.060	0.603	2.257	0.502	2.461	0.407	2.667	0.321	2.873	0.244	3.073
19	1.180	1.401	1.074	1.536	0.967	1.685	0.859	1.848	0.752	2.023	0.649	2.206	0.549	2.396	0.456	2.589	0.369	2.783	0.290	2.974
20	1.201	1.411	1.100	1.537	0.998	1.676	0.894	1.828	0.792	1.991	0.692	2.162	0.595	2.339	0.502	2.521	0.416	2.704	0.336	2.885
21	1.221	1.420	1.125	1.538	1.026	1.669	0.927	1.812	0.829	1.964	0.732	2.124	0.637	2.290	0.547	2.460	0.461	2.633	0.380	2.806
22	1.239	1.429	1.147	1.541	1.053	1.664	0.958	1.797	0.863	1.940	0.769	2.090	0.677	2.246	0.588	2.407	0.504	2.571	0.424	2.734
23	1.257	1.437	1.168	1.543	1.078	1.660	0.986	1.785	0.895	1.920	0.804	2.061	0.715	2.208	0.628	2.360	0.545	2.514	0.465	2.670
24	1.273	1.446	1.188	1.546	1.101	1.656	1.013	1.775	0.925	1.902	0.837	2.035	0.751	2.174	0.666	2.318	0.584	2.464	0.506	2.613
25	1.288	1.454	1.206	1.550	1.123	1.654	1.038	1.767	0.953	1.886	0.868	2.012	0.784	2.144	0.702	2.280	0.621	2.419	0.544	2.560
26	1.302	1.461	1.224	1.553	1.143	1.652	1.062	1.759	0.979	1.873	0.897	1.992	0.816	2.117	0.735	2.246	0.657	2.379	0.581	2.513
27	1.316	1.469	1.240	1.556	1.162	1.651	1.084	1.753	1.004	1.861	0.925	1.974	0.845	2.093	0.767	2.216	0.691	2.342	0.616	2.470
28	1.328	1.476	1.255	1.560	1.181	1.650	1.104	1.747	1.028	1.850	0.951	1.958	0.874	2.071	0.798	2.188	0.723	2.309	0.650	2.431
29	1.341	1.483	1.270	1.563	1.198	1.650	1.124	1.743	1.050	1.841	0.975	1.944	0.900	2.052	0.826	2.164	0.753	2.278	0.682	2.396
30	1.352	1.489	1.284	1.567	1.214	1.650	1.143	1.739	1.071	1.833	0.998	1.931	0.926	2.034	0.854	2.141	0.782	2.251	0.712	2.363
31	1.363	1.496	1.297	1.570	1.229	1.650	1.160	1.735	1.090	1.825	1.020	1.920	0.950	2.018	0.879	2.120	0.810	2.226	0.741	2.333
32	1.375	1.502	1.309	1.574	1.244	1.650	1.177	1.732	1.109	1.819	1.041	1.909	0.972	2.004	0.904	2.102	0.836	2.203	0.769	2.306
33	1.383	1.508	1.321	1.577	1.258	1.651	1.193	1.730	1.127	1.813	1.061	1.900	0.994	1.991	0.927	2.085	0.861	2.181	0.795	2.281
34	1.393	1.514	1.333	1.580	1.271	1.652	1.208	1.728	1.144	1.808	1.080	1.891	1.015	1.979	0.950	2.069	0.885	2.162	0.821	2.257
35	1.402	1.519	1.343	1.584	1.283	1.653	1.222	1.726	1.160	1.803	1.097	1.884	1.034	1.967	0.971	2.054	0.908	2.144	0.845	2.236
36	1.411	1.525	1.354	1.587	1.295	1.654	1.236	1.724	1.175	1.799	1.114	1.877	1.053	1.957	0.991	2.041	0.930	2.127	0.868	2.216
37	1.419	1.530	1.364	1.590	1.307	1.655	1.249	1.723	1.190	1.795	1.131	1.870	1.071	1.948	1.011	2.029	0.951	2.112	0.891	2.198
38	1.427	1.535	1.373	1.594	1.318	1.656	1.261	1.722	1.204	1.792	1.146	1.864	1.088	1.939	1.029	2.017	0.970	2.098	0.912	2.180
39	1.435	1.540	1.382	1.597	1.328	1.658	1.273	1.722	1.218	1.789	1.161	1.859	1.104	1.932	1.047	2.007	0.990	2.085	0.932	2.164
40	1.442	1.544	1.391	1.600	1.338	1.659	1.285	1.721	1.230	1.786	1.175	1.854	1.120	1.924	1.064	1.997	1.008	2.072	0.952	2.149
45	1.475	1.566	1.430	1.615	1.383	1.666	1.336	1.720	1.287	1.776	1.238	1.835	1.189	1.895	1.139	1.958	1.089	2.022	1.038	2.088
50	1.503	1.585	1.462	1.628	1.421	1.674	1.378	1.721	1.335	1.771	1.291	1.822	1.246	1.875	1.201	1.930	1.156	1.986	1.110	2.044
55	1.528	1.601	1.490	1.641	1.452	1.681	1.414	1.724	1.314	1.768	1.334	1.814	1.294	1.861	1.253	1.909	1.212	1.959	1.170	2.010
60	1.549	1.616	1.514	1.652	1.480	1.689	1.444	1.727	1.408	1.767	1.372	1.808	1.335	1.850	1.298	1.894	1.260	1.939	1.222	1.984
65	1.567	1.629	1.536	1.662	1.503	1.696	1.471	1.731	1.438	1.767	1.404	1.805	1.370	1.843	1.336	1.882	1.301	1.923	1.266	1.964
70	1.583	1.641	1.554	1.672	1.525	1.703	1.494	1.735	1.464	1.768	1.433	1.802	1.401	1.837	1.369	1.873	1.337	1.910	1.305	1.948
75	1.598	1.652	1.571	1.680	1.543	1.709	1.515	1.739	1.487	1.770	1.458	1.801	1.428	1.834	1.399	1.867	1.369	1.901	1.339	1.935
80	1.611	1.662	1.586	1.688	1.560	1.715	1.534	1.743	1.507	1.772	1.480	1.801	1.453	1.831	1.425	1.861	1.397	1.893	1.369	1.925
85	1.624	1.671	1.600	1.696	1.575	1.721	1.550	1.747	1.525	1.774	1.500	1.801	1.474	1.829	1.448	1.857	1.422	1.886	1.396	1.916
90	1.635	1.679	1.612	1.703	1.589	1.726	1.566	1.751	1.542	1.776	1.518	1.801	1.494	1.827	1.469	1.854	1.445	1.881	1.420	1.909
95	1.645	1.687	1.623	1.709	1.602	1.732	1.579	1.755	1.557	1.778	1.535	1.802	1.512	1.827	1.489	1.852	1.465	1.877	1.442	1.903
100	1.654	1.694	1.634	1.715	1.613	1.736	1.592	1.758	1.571	1.780	1.550	1.803	1.528	1.826	1.506	1.850	1.484	1.874	1.462	1.898
150	1.720	1.746	1.706	1.760	1.693	1.774	1.679	1.788	1.665	1.802	1.651	1.817	1.637	1.832	1.622	1.847	1.608	1.862	1.594	1.877
200	1.758	1.778	1.748	1.789	1.738	1.799	1.728	1.810	1.718	1.820	1.707	1.831	1.697	1.841	1.686	1.852	1.675	1.863	1.665	1.874



## END SEMESTER EXAMINATION

May/June-2019

PAPER CODE GE-003

## PRODUCTION AND OPERATIONS MANAGEMENT

Time: 3:00 Hours

Max. Marks : 75

Note: Answer any five questions, question no one is compulsory.  
All questions carry equal marks.  
Assume suitable missing data, if any.  
Use of simple calculator is allowed.

Q.1) Write the short note on the following-(Any Five)

- (i) 2-Card KANBAN
- (ii) Just in Time (JIT)
- (iii) Flexible Manufacturing System (FMS)
- (iv) Material Resource Planning (MRP)
- (v) Mean Absolute Deviation (MAD)
- (vi) Product & Process Design Matrix
- (vii) Decision tree Analysis for capacity planning

Q.2( a) What does the term operations strategy mean and also explain operations strategy adopted by air Deccan airlines to become India's First low cost airlines.

(b) Explain Aggregate Production Planning (APP) and its need in organizations, also explain how we can find out Aggregate Production using Linear Programming Problem (LPP).

Q.3 (a) What do you understand by the term operations & production management. What are the major operations issues that manufacturing organisations face in India.

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(b) Explain Lean Management and how lean management helps the organisation to minimise their waste.

Q.4) (a) Explain queuing system and obtain steady state solution for M/M/1 model. And solve the following problem:

TV repairman finds that the time spent on his jobs has an exponential distribution with mean 30 minutes. If he repairs sets in the order in which they come in, and if the arrival of sets is approximately Poisson with an average rate of 10 per 8-hour day, what is repairman's expected idle time each day? How many jobs are ahead of the average set just brought in?

(b) Explain Scheduling and its importance in industry also explain various rules for scheduling.

Q.5) (a) Explain forecast and forecasting in detail and also explain various components of time series.

(b) Below are given the figures of production (in thousands units) of air conditioner manufacturing factory:

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Production	17	20	19	26	24	40	35	55	51	74	79

1. Fit the second degree parabolic trend curve to the above data.
2. Obtain and eliminate the trend values.

Q.6) (a) Describe Statistical Quality Control (S.Q.C). Discuss the various criterion for detecting lack of control in mean and range chart. Also discuss cause of variation in quality.

(b) Construct the mean and range chart from the following data and comment on the chart:

(given for  $n=5$ ,  $A_2=0.58$ ,  $D_3=0$ ,  $D_4=2.11$ )

Sample No. :	1	2	3	4	5	6	7	8	9	10	11	12
Sample Range :	45	48	62	48	36	81	78	42	69	34	48	75
Sample Mean :	69	63	57	64	57	82	85	33	46	112	93	95

Q.7) (a) What is the role of maintenance in a manufacturing system? Also explain Equipment Life Cycle.

(b) Why organizations need to carry inventory? also explain ABC Classification scheme for selective control of inventories with the help of suitable example.