



**WEST BENGAL STATE UNIVERSITY**  
B.Com. Programme 2nd Semester Examination, 2023

**FACGCOR04T-B.COM. (DSC4)**

**BUSINESS MATHEMATICS AND STATISTICS**

Time Allotted: 2 Hours

Full Marks: 50

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.  
All symbols are of usual significance.*

**GROUP-A**

1. Answer any **five** questions from the following: 2×5 = 10
- (a) Three sets  $A$ ,  $B$  and  $C$  are such that  $A - B = \{2, 4, 6\}$ ,  $A - C = \{2, 3, 5\}$ , find  $A - (B \cup C)$
- (b) If  $A^{-1} = \frac{1}{4} \begin{bmatrix} 3 & -5 \\ 0 & 7 \end{bmatrix}$  find  $A$
- (c) Evaluate  $\lim_{x \rightarrow 3} \frac{\sqrt{x} - \sqrt{3}}{x^2 - 9}$
- (d) If  $x = \sqrt{1+t}$ ,  $y = \sqrt{1-t}$ , find  $\frac{dy}{dx}$ .
- (e) If the G.M of  $a, 4, 8$  be 6, find  $a$ .
- (f) Obtain  $\sigma_x$  if  $r_{xy} = 0.6$ ,  $\sigma_y = 4$  and  $b_{xy} = 0.48$
- (g) Find S.D of 1, 5, 6
- (h) If  $y = 2x + 7$  and  $\bar{x} = 20$ , find  $\bar{y}$ .

**GROUP-B**

Answer any **four** questions from the following

5×4 = 20

2. For three sets  $A$ ,  $B$  and  $C$ , prove (without Venn diagram) that  
 $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
3. Solve the system of equations by Cramer's rule:  
 $x - 2y + z = -1$ ,  $3x + y - 2z = 4$ ,  $y - z = 1$
4. In what time will a sum of money double itself at 5% compound interest?
5. The monthly wages (in Rs) of 30 workers of a factory are given below:
- |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 56 | 65 | 58 | 39 | 47 | 78 | 87 | 52 | 50 | 51 |
| 65 | 56 | 65 | 61 | 52 | 69 | 47 | 67 | 76 | 83 |
| 44 | 32 | 40 | 52 | 82 | 71 | 59 | 57 | 68 | 61 |

Prepare a frequency distribution with 6 equal class intervals.

6. Construct a grouped frequency distribution from the following data and hence find A.M.

Marks	No. of Students
Less than 10	175
Less than 20	360
Less than 30	680
Less than 40	790
Less than 50	900
Less than 60	1000

7. Find the median from the following data:

Marks	0-10	10-30	30-60	60-70	70-80
No. of students	14	25	30	5	10

### GROUP-C

Answer any *two* questions from the following

10×2 = 20

8. (a) Show that the maximum value of  $2x + \frac{1}{2x}$  is less than its minimum value. 5

- (b) If  $A = \begin{bmatrix} 3 & 2 \\ 2 & 1 \end{bmatrix}$ , then show that  $A^2 - 4A - I = 0$  and hence find  $A^{-1}$ . 5

9. (a) Draw a suitable diagram from the following data. 5

Revenue earning of the central government:

Customs	: Rs. 160 crores
Excise	: Rs. 450 crores
Income Tax	: Rs. 380 crores
Corporation Tax	: Rs. 110 crores
Other Sources	: Rs. 200 crores

- (b) In a distribution  $n = 10$ ,  $\Sigma x = 20$ ,  $\Sigma x^2 = 200$ . Find the value of S.D. 5

- 10.(a) Calculate the mean deviation about A.M. of the following distribution. 5

$x$	5	15	25	35	45	55	65
$f$	4	6	10	20	10	6	4

- (b) The mode of the following distribution is Rs. 66. Find the missing frequency. 5

Daily wages (Rs.)	30-40	40-50	50-60	60-70	70-80	80-90
No. of workers	8	16	22	28	?	12

11. Construct Fisher's Ideal Index Number for the following data: 10

Commodity	1980 (base year)		1988 (current year)	
	Price	Quantity	Price	Quantity
A	8	6	12	5
B	10	5	11	6
C	7	8	8	5

12. Fit a straight line trend by the method of least squares from the following data and estimate the profit for the year 2005. 10

Year	1975	1980	1985	1990	1995	2000
Profit (Lakhs)	10	13	15	20	22	28

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WEST BENGAL STATE UNIVERSITY  
B.Com. Programme 2nd Semester Examination, 2023

FACGCOR03T-B.COM. (DSC3)

COST AND MANAGEMENT ACCOUNTING

Time Allotted: 2 Hours

Full Marks: 50

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All symbols are of usual significance.*

GROUP-A / বিভাগ-ক

Answer any *two* questions from the following

10×2 = 20

নিম্নলিখিত যে-কোনো দুটি প্রশ্নের উত্তর দাও

1. What do you mean by 'Management Accounting'? Distinguish between Cost Accounting and Management Accounting. 3+7  
পরিচালন হিসাবরক্ষণ বলতে কি বোঝো? পরিব্যয় হিসাবরক্ষণ ও পরিচালন হিসাবরক্ষণের মধ্যে পার্থক্য নির্ণয় করো।
2. Following are the details supplied by XY Ltd. in respect of its raw materials for the month of December, 2022: 10

Date	Receipts		Issues
	Units	Amount(₹)	Units
01.12.22	(Opening) 1,000	6,000	—
10.12.22	500	3,500	—
15.12.22	—	—	1,200
20.12.22	1,000	8,000	—
31.12.22	—	—	1,100

On 31<sup>st</sup> December, a shortage of 50 units was found. Prepare a Store Ledger Account under LIFO method.

3. Time allowed for the production of 100 'Bolt' in 2 hrs and hourly rate of wage payment is ₹12. A and B produced 600 and 500 pieces of 'Bolt' respectively in a particular day of 8 hours. 5+5  
Calculate their earnings under Halsey Premium Bonus and Rowan Premium Bonus Method.

## GROUP-B / বিভাগ-খ

Answer any *two* questions from the following

15×2 = 30

নিম্নলিখিত যে-কোনো দুটি প্রশ্নের উত্তর দাও

4. A company has three production departments P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub> and one service departments S. 15

The actual costs in 2022 are as follows:

Depreciation ₹7,000; Rent, Rates and Taxes ₹4,500; Electricity ₹6,000; Sundries ₹1,300; Canteen Expenses ₹5,500; Insurance on Assets ₹1,400; Power ₹1,200

Other information:

	Production Depts.			Service Dept.
	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	S
Value of Assets (₹)	25,000	20,000	15,000	10,000
Floor Space (Sq. metres)	300	250	200	150
Light Points (No.)	10	8	8	4
H. P of Machines	5	4	3	—
No. of Employees	40	30	20	10
Direct Wages (₹)	3,000	2,000	1,000	500

Cost of the service department is apportioned to production departments in the ratio of 3:2:1.

From the above particulars, determine the total overhead cost of production departments.

5. From the following informations, prepare a Cost Sheet for the period ended on 31.12.2022 in the book of M/S Tarapada: 15

Raw material consumed	₹75,000
Chargeable expenses	₹ 5,000
Production wages	₹15,000
Work overhead	1/5 <sup>th</sup> of work cost
Office and Administrative overhead	10% of work cost
Selling and Distribution overhead	₹4 per unit
Units Produced and Sold	10,000
Profit	25% on Sales

6. (a) What is normal loss in process costing? (প্রসেস কস্টিং-এ স্বাভাবিক ক্ষতি কাকে বলে?) 2+2+6+5

(b) What do you mean by equivalent production units? (ইকুইভ্যালেন্ট প্রোডাকশান একক কাকে বলে?)

(c) From the information given below, prepare:

(i) Process × Account; (ii) Abnormal Loss Account.

1,000 tonnes @ ₹125 per tonne were initially introduced into the process.

Other expenses incurred in the process:

Wages ₹28,000 and Factory overheads ₹8,000.

Normal wastage: 5% of total weight of material initially introduced.

Output: 830 tonnes.

Normal Scrap: 10% of the initial quantity introduced.

Scrap realisation: @ ₹80 per tonne.

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WEST BENGAL STATE UNIVERSITY  
B.Com. Honours 2nd Semester Examination, 2023

FACHGEC02T-B.COM. (GE2)

BUSINESS MATHEMATICS AND STATISTICS

Time Allotted: 2 Hours

Full Marks: 50

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All symbols are of usual significance.*

GROUP-A

Answer any *five* questions from the following

2×5 = 10

1. (a) If  $A = \{1, 2, 3, 4\}$ ,  $B = \{3, 4, 5\}$ , then find  $(A \cup B) - (A \cap B)$ .
- (b) If  $A = \begin{bmatrix} 2 & 2 \\ 4 & 3 \end{bmatrix}$ , show that  $AA^{-1} = I_2$ , where  $I_2$  is the second order unit matrix.
- (c) Evaluate:  $\lim_{x \rightarrow 1} \frac{4x^5 + 9x + 7}{3x^6 + x^4 + 1}$
- (d) If  $x = at^2$ ,  $y = 2at$  then find  $\frac{dy}{dx}$ .
- (e) If  $\text{cov}(x, y) = -40$ ,  $\sigma_x = 8$ ,  $\sigma_y = 15$  then obtain the correlation coefficient of  $x$  and  $y$ .
- (f) If  $y = 2x - 10$  and  $\bar{x} = 11$ , find  $\bar{y}$ .
- (g) Find the variance of 2, 5, 8.
- (h) Give reason to justify that the following statement can not be true:  
 $b_{yx} = 0.8$  and  $b_{xy} = -0.3$ .

GROUP-B

Answer any *four* questions from the following

5×4 = 20

2. Show that  $\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} = (a+b+c)^3$ .
3. In an examination 45% of the candidates have passed in English, 40% have passed in Bengali, while 30% have passed in both the subjects. Find the total number of candidates if 90 of them have failed in both the subjects.
4. Find the maximum and minimum value of the function  $f(x) = 4x^3 - 15x^2 + 12x - 2$ .
5. Calculate the coefficient of correlation from the following:

$x$	1	2	3	4	5
$y$	16	8	11	18	12

6. Draw a less than type ogive from the following distribution.

Marks group	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	4	8	11	6	5	3

7. Calculate the mode from the following data:

Class	5-14	15-19	20-29	30-39	40-44	45-49
Frequency	4	6	10	15	8	2

8. Find the coefficient of variation of the following data:

Marks	0-10	10-20	20-30	30-40	40-50
No. of students	4	10	16	12	8

**GROUP-C**

Answer any *two* questions from the following

10×2 = 20

9. (a) Solve by Cramer's rule:

$$x - y + 2z = 1, \quad x + y + z = 2, \quad 2x - y + z = 5$$

5

(b) Fit a straight line trend by the method of least square and the estimate the value for 2020.

5

Year	2010	2011	2012	2013	2014	2015	2016	2017
Value	8	9	10	6	7	9	12	8

10. The score of two batters A and B in 10 innings during a certain session are:

10

A	32	28	47	63	71	39	10	60	96	14
B	19	31	48	53	67	90	10	62	40	80

Find which of the two batters A and B, is more consistant.

11. Find x from the following data:

10

Commodities	Base year		Current year	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	1	10	2	5
B	1	5	x	2

Given that the ratio between Laspeyre's and Paasche's Index numbers is 28:27

12.(a) Compute 5-year moving averages of the following time series data:

5

Year	1	2	3	4	5	6	7	8	9	10	11	12
Rainfall (inches)	96	101	103	91	89	103	121	123	118	117	137	151

(b) From the following data, calculate the cost of living index numbers

5

Group	Weight	Index Number
		Base: 1952-53 = 100
Food	50	241
Clothing	2	221
Fuel and Light	3	204
Rent	16	256
Misc.	29	179

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**WEST BENGAL STATE UNIVERSITY**  
B.Com. Honours 2nd Semester Examination, 2023

**FACACOR03T-B.COM. (CC3)**  
**COST AND MANAGEMENT ACCOUNTING-I**

Time Allotted: 2 Hours

Full Marks: 50

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**GROUP-A**

Answer any *two* questions from the following

10×2 = 20

1. (a) Following information has been extracted from the records of costing dept. of SB Enterprises in respect of job no. 111. 6+4  
Material consumed ₹6000  
Wages paid in—  
Dept X : 90 hours @ ₹15 p.h.  
Dept Y: 60 hours @ ₹20 p.h.  
Dept Z: 30 hours @ ₹10 p.h.  
Variable Overhead ₹10 p.h.  
Fixed Overhead ₹50,000 for 10000 hours  
Calculate cost of job no. 111.
- (b) State the difference between Job Costing and Batch Costing.
2. (a) What is Bin Card? 2+8  
(b) Excel Ltd. furnishes you the following information:  
(i) Annual requirement of Material-X: 15,000 units.  
(ii) Ordering costs Rs. 375 for every order.  
(iii) Cost per unit- Rs. 25.  
(iv) Inventory Carrying charges are 20% on average inventory.  
(v) Safety stock is 15 days consumption and time required to get a new supply is 10 days.  
Ascertain: (a) Economic Order quantity; (b) Ordering Level.  
[Assume 1 year = 300 effective days and consumption per day is uniform]
3. (a) What do you mean by labour turnover? State any two causes of labour turnover. 2+2+6  
(b) A factory working on the job order system pays its workers under the Halsey Premium Bonus Scheme. Workers also get a D.A. of Rs. 120 per week of 48 hours.

A worker's basic wages is Rs. 20 per day of 8 hours and his time sheet for a week is summarised below:

Job No.	Time allowed	Time taken
2015	35 hours	30 hours
2078	40 hours	32 hours
Idle time (waiting)		5 hours
		67 hours

Calculate the Total earning he has earned for the week.

### GROUP-B

Answer any *two* questions from the following

4. The Moon Light Ltd. has three production departments A, B, C and two service departments X and Y. The following figures are extracted from the records of the company for a particular period:

15×2 = 30

12+3

	Rs.
Rent and Rates	25,000
Power	7,500
Lighting	3,000
Depreciation on Machinery	50,000
Canteen Expenses	3,250
Indirect Wages	6,250
Sundries	50,000

Other information:

	Production Departments			Service Departments	
	A	B	C	X	Y
Direct wages (Rs.)	15,000	10,000	15,000	7,500	2,500
Indirect wages (Rs.)	1,250	2,500	500	1,250	750
No. of light points	10	15	20	10	5
No. of employees	25	20	10	5	5
Floor area (sq. ft.)	2,000	2,500	3,000	2,000	500
H.P. of machines	60	30	50	10	—
Value of Machineries (Rs.)	1,20,000	1,60,000	2,00,000	10,000	10,000
Production hours worked	2560	4,910	5510		
Expenses of service departments X and Y are apportioned as below:					
	A	B	C	X	Y
X	2	2	1	—	—
Y	2	1	2	—	—

You are required to:

- Compute overhead rate per production hour of each production department.
- Determine total cost of Product Z which is processed through departments A, B and C for 9 hours, 8 hours and 11 hours respectively. Given that Direct Material cost is Rs. 5,000 and Direct Wages is Rs. 3,000.



5. Bright Ltd. produced a product passes through two distinct processes X and Y and then to finished stock. From the following information, prepare Process X A/c, Process Y A/c, Normal Loss A/c, Abnormal loss A/c and Abnormal Gain A/c:

15

Particulars	Process X	Process Y
Input units	15,000	13,000
Materials (Rs.)	30,000	4,000
Direct Wages (Rs.)	18,000	15,275
Overhead (Rs.)	9,000	10,950
Normal Loss	10%	?
Scrap Value per unit (Rs.)	2.00	3.00

There is no opening and closing work-in-progress. The final output from process Y transferred to finished stock 12,500 units. The finished goods are sold at Rs. 7.50 per unit with a profit of Re. 1.00 per unit.

6. Sunshine Ltd. supplies the following details in respect of a truck of 5 tonne capacity:

15

Cost of Truck – ₹18,00,000  
 Estimated Life – 10 years  
 Lubricant – ₹150 per trip each way;  
 Repair and Maintenance – ₹10000 p.m.  
 Driver's Wage – ₹15000 p.m.  
 Cleaner's Wage – ₹5000 p.m.  
 Insurance, tax and others – ₹1,20,000 p.a.

The truck gives an average of 10 kms per litre of diesel and cost of diesel is ₹65/litre. The truck carries goods to and from the city covering a distance of 50 kms each way. On outward trip, freight is available to the extent of 80% capacity and on return 20% of capacity. The truck runs on an average 25 day a month.

Calculate the operating cost per tonne-km and rate per tonne-km that the company should charge if a profit of 50% on freightage is to be earned.

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**WEST BENGAL STATE UNIVERSITY**  
B.Com. Honours 2nd Semester Examination, 2023

**FACACOR04T-B.COM. (CC4)**

**MARKETING MANAGEMENT AND HUMAN RESOURCE MANAGEMENT**

Time Allotted: 2 Hours

Full Marks: 50

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.*

**GROUP-A**

1. Answer any *five* questions from the following: 2×5 = 10
- Define Human Resource Management.
  - What do you mean by "Product"?
  - Define Job Analysis.
  - What is Salesmanship?
  - Define Induction Training.
  - What is the modern concept of Marketing?
  - Define Performance Appraisal.
  - What do you mean by Promotion mix?

**GROUP-B**

2. Answer any *four* questions from the following: 5×4 = 20
- Distinguish between Micro and Macro environment of Marketing.
  - Explain the scope of Human Resource Management.
  - Discuss the difference between Advertising and Sales Promotion.
  - Explain the objectives of Performance Appraisal.
  - What are the essentials of a sound remuneration system?
  - Explain the features of Industrial Relations.

**GROUP-C**

3. Answer any *two* questions from the following: 10×2 = 20
- What is Market Segmentation? Explain the different bases of Market Segmentation. 3+7
  - What do you mean by Sound Industrial Relations? Discuss the factors influencing Industrial Relations. 3+7
  - Explain the new product development process. 10
  - Define Recruitment. Discuss the steps involved in Selection Process. 3+7

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