

2020/TDC/ODD/SEM/BMTP/  
ENPP-304 (A/B)/230

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TDC Odd Semester Exam., 2020  
held in July, 2021

COMMERCE

( Pass )

( 3rd Semester )

Course No. : BCMP-304

Full Marks : 50

Pass Marks : 17

Time : 2 hours

The figures in the margin indicate full marks  
for the questions

Candidates have to answer either Option—A  
or Option—B

OPTION—A

Course No. : BCMP-304 (A)

( BUSINESS MATHEMATICS )

Answer **five** questions, taking **one** from each Unit

UNIT—I

1. (a) Show that the letters of the word 'CALCUTTA' can be arranged in twice as many ways as the letter of the word 'AMERICA'. 3

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- (b) If  $A = \begin{pmatrix} 4 & 2 \\ 1 & 1 \end{pmatrix}$ , then find  $(A - 2I)(A + 3I)$ , where  $I$  is the unit matrix and express the above product in a matrix form. 4

- (c) Solve : 3  
 $3^{2x-1} = (\sqrt{3})^{x-3}$

2. (a) If  $A = \begin{pmatrix} 2 & 1 \\ 1 & 3 \end{pmatrix}$ ,  $B = \begin{pmatrix} 1 & 3 \\ 0 & 2 \end{pmatrix}$  then find  $2A - 3B$ . 4

- (b) Find the coefficient of  $x^8$  in the expansion of  $(1 - x^2)^{10}$ . 4

- (c) If  ${}^n P_2 = 12$ , then find the value of  $n$ . 2

UNIT—II

3. (a) Define a function  $f(x)$  of  $x$ . A function  $f(x)$  is defined as follows :  
 $f(x) = \begin{cases} 3 - 2x, & \text{for } 3/2 \leq x < 0 \\ 3 + 2x, & \text{for } 0 \leq x < 3/2 \end{cases}$

Show that  $f(x)$  is continuous at  $x = 0$ . 3

- (b) Evaluate the following (any two) :  $2 \times 2 = 4$

(i)  $\lim_{x \rightarrow 2} \frac{x^2 - x - 2}{x^2 - 4}$

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(ii)  $\lim_{x \rightarrow 1} \frac{x^3 - x^2 - x + 1}{x^3 - x^2 - x + 1}$

(iii)  $\lim_{x \rightarrow 1} \frac{1}{\sqrt{x-1} - \sqrt{x+1}}$

(c) The total cost C of output x is given by

$C = x^3 - 2x^2 + 4x + 15$

Find—

(i) the average cost when output is 3 units;

(ii) the marginal cost when output is 4 units. 3

4. (a) Find the derivative or differential coefficient of the following (any two) :

2×2=4

(i)  $y = (2x - 5)^6(2x + 1)$

(ii)  $y = \sqrt{x-1} - \sqrt{x+1}$

(iii)  $y = e^x \log x$

(b) If  $y = x \log y$ , then show that

$x \frac{dy}{dx} = \frac{y^2}{y-x}$

3

(c) Show that the function

$f(x) = x^3 - 6x^2 + 9x + 8$

has a maximum value at  $x = 1$ . 3

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UNIT—III

5. (a) Find the first-order partial derivative of  $x^2 - 6xy + y^2 + 0$ . 3

(b) If  $f(x, y) = 3x^3 - 5x^2y + 2y^3$ , then show that

$x \frac{f}{x} - y \frac{f}{y} = 3f(x, y)$

3

(c) If  $u = 2x^2 - 4xy + 3y^2$ , then find the value of

$\frac{\partial^2 u}{\partial x \partial y}$  and  $\frac{\partial^2 u}{\partial x^2}$

4

6. (a) Verify that  $\frac{\partial^2 u}{\partial x \partial y} = \frac{\partial^2 u}{\partial y \partial x}$ , where

$u = \log \frac{x^2 + y^2}{xy}$

5

(b) If  $V = f(x, y, z, z, x)$ , then prove that

$\frac{\partial V}{\partial x} + \frac{\partial V}{\partial y} + \frac{\partial V}{\partial z} = 0$

5

UNIT—IV

7. (a) Evaluate any two of the following : 3×2=6

(i)  $\int x^2 \log x \, dx$

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(ii)  $x^3 \sqrt{1 - 3x^4} dx$

(iii)  $\frac{e^x}{1 - e^x} dx$

(b) Evaluate any one of the following : 4

(i)  $\int_1^{e^2} \frac{dx}{x(1 - \log x)^2}$

(ii)  $\int_1^9 (2x^2 - 2x - \sqrt{x}) dx$

8. (a) Give the geometrical interpretation of

$\int_a^b f(x) dx$  2

(b) Evaluate any one of the following : 4

(i)  $\frac{dx}{e^x - 1}$

(ii)  $\frac{\log x}{(x - 1)^2} dx$

(c) Evaluate any one of the following : 4

(i)  $\int_e^2 \frac{dx}{x \log x}$

(ii)  $\int_1^2 x^2 e^x dx$

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UNIT—V

9. (a) Write three basic assumptions of linear programming problem. Give one example each of linear function and linear equation. 3+2=5

(b) Solve the following by graphical method : 5

Maximize  $Z = 7x + 5y$   
subject to the constraints  
 $x + 2y = 6$   
 $4x + 3y = 12$   
 $x, y \geq 0$

10. (a) Explain any one of the following : 4

- (i) General formulation of LPP
- (ii) Graphical method of solution of LPP

(b) Solve the following LPP by using simplex method : 6

Minimize  $Z = 4x + 2y$   
subject to the constraints  
 $3x + y = 27$   
 $x + y = 21$   
 $x + 2y = 30$   
 $x, y \geq 0$

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OPTION—B

Course No. : BCMP-304 (B)

( **ENTREPRENEURSHIP—I** )

Answer **five** questions, taking **one** from each Unit

UNIT—I

1. Who is an entrepreneur? Briefly discuss the different classes of entrepreneurs. 2+8=10
2. Define intrapreneur. Distinguish between entrepreneur and intrapreneur. 2+8=10

UNIT—II

3. Explain how social factors affect the development of entrepreneurship. 10
4. Do you think decision making is important for growth of entrepreneurial activities? What factors should be considered while taking entrepreneurial venture? 4+6=10

UNIT—III

5. What is meant by promotion of venture? Discuss the prime stages of promotion of a venture. 3+7=10
6. Discuss the various factors of opportunity analysis. 10

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UNIT—IV

7. Discuss the role of EDP in promoting entrepreneurial activities. 10
8. What are the different institutions established by the Government for conducting EDP in India? 10

UNIT—V

9. Give a brief account of the entrepreneurial activities of Acharya Prafulla Chandra Roy. 10
10. Evaluate the contribution of Jamsetji Tata as an entrepreneur in India. 10

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