

SARDAR PATEL UNIVERSITY
B. B. A. (General / ITM) (II Semester) Examination
5th April 2016 (Tuesday)
2.30 pm – 4.30 pm
UM02CBBA06 / UM02CBBI06 – BUSINESS MATHEMATICS – II

Total Marks : 60

- Note:** (1) Figures to the right indicate marks.
 (2) Graph paper and log tables will be supplied on request.

Q. 1

- (A) Find n: (04)

$${}_n P_4 = 12 [{}_n P_2]$$
 (B) How many different words can be formed using all the letters of the word "TEJAL" without repetition? Out of which in how many words (06)
 (i) A is at the start?
 (ii) A is at the start and T is at the end?
 (C) In how many ways a committee of 4 persons can be formed from 4 boys and 5 girls in which there are at least 2 boys? (05)

OR

Q. 1

- (A) Evaluate: (04)
 (i) ${}_{10} C_8 \times {}_5 C_2$
 (ii) ${}_7 P_3 \times {}_5 P_2$
 (B) How many numbers of 6 digits can be formed from the digits 4, 5, 6, 7, 8 and 9; if no digit is repeated? How many of them are divisible by 5? (06)
 (C) In how many ways can you select two salesmen and three software programmers out of 7 salesmen and 5 software programmers? (05)

Q. 2

- (A) State the rules of differentiation. (04)
 (B) Find $\frac{dy}{dx}$: (06)
 (i) $y = x^3 + 3x^2 + 100$
 (ii) $y = \frac{1}{(3x+4)}$
 (iii) $y = x(\log x)$
 (C) Find maximum and minimum values of $f(x) = x^3 + 6x^2 - 15x + 7$. (05)

OR

Q. 2

- (A) Find $\frac{d^2y}{dx^2}$ if $y = \frac{\log x}{x}$. (04)
 (B) Find $\frac{dy}{dx}$: (06)
 (i) $y = t^2 + t + 1, x = 2t^2 + 1$
 (ii) $y = \log(5x^2 + 4x + 3)$

- (C) The demand function of a commodity is $P = 50 - \left(\frac{5}{2}\right)x$. Determine demand and price for maximum revenue. (05)

Q. 3

- (A) Explain the following terms: (04)
 (i) Annuity (ii) Sinking Fund
- (B) The cost of building a new house at present is ₹ 7,50,000/-. If it increases at 5% every year find out the increased cost of a similar house if it is build after 4 years. (06)
- (C) Alok deposited ₹ 15,000/- with a leasing company at 11% rate of compound interest. What amount will he receive at the end of 5 years? How much interest will he get? (05)

OR

Q. 3

- (A) Find the compound interest on ₹ 5,000/- at 5% per annum for 5 years compounded annually. (04)
- (B) A company issued 50,000 debentures each of ₹ 100/- to be redeemed after 10 years. It was decided to create a sinking fund for this purpose and to invest it at 12.5% rate of compound interest. Find out the sum to be transferred to this fund at the end of every year. (06)
- (C) Nidhi Chemicals fixes a target of producing 50,000 tons at the end of 7 years. If the production grows at a rate of 5% per annum, find the present day production of the company. (05)

Q. 4

- (A) Write assumptions of Linear Programming Problem. (04)
- (B) Obtain a basic feasible solution of the following transportation problem by North-West corner method. (06)

From	To					Supply
	A	B	C	D	E	
X	4	5	7	9	10	8
Y	3	2	3	6	9	12
Z	8	12	15	30	4	12
W	3	2	11	13	17	8
Demand	4	14	6	8	8	40

- (C) Solve the following minimal assignment problem. (05)

Persons	Job			
	P	Q	R	S
A	12	15	18	8
B	13	10	9	14
C	10	12	15	13
D	7	8	9	14

OR

Q. 4

(A) Explain : Transportation Problem. (04)

(B) Solve the following linear programming problem by graphical method. (06)

$$\text{Maximise } Z = 3x + 4y$$

Subject to,

$$2x + 5y \leq 120$$

$$4x + 2y \leq 80$$

$$x \geq 0$$

$$y \geq 0$$

(C) Obtain the solution of the following transportation problem by matrix minima method. (05)

From	To			Supply
	A	B	C	
X	10	9	8	8
Y	10	7	10	7
Z	11	9	7	9
W	12	14	10	4
Demand	10	10	8	28

