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SARDAR PATEL UNIVERSITY  
BBA (II Semester) Examination  
Friday, 21 February 2014  
2.30 - 4.30 pm  
UM02CBBI06 - Business Mathematics II

Total Marks: 60

NOTE: Log tables will be provided on request

- Q1 A Find n : (1)  ${}_n P_4 = 840$  (2)  ${}_n P_4 = 12 \cdot {}_n P_2$  05  
B How many different words can be made out of the letters of the word 'ANANDPURA'? In how many of these will the vowels occupy the even places? 05  
C How many five digit telephone number connections can be given, using 1, 2, . . . , 9, 0? 05

OR

- Q1 A Find n if  $3 \cdot {}_n C_4 = 5 \cdot (n-1) C_5$  05  
B A cricket team of 11 players is to be formed from 17 players including 4 bowlers and 2 wicket keepers. In how many different ways can a team be formed so that the team contains at least 3 bowlers and at least one wicket-keeper? 05  
C In how many ways four cards of (1) different suits and (2) same suits, can be selected from 52 playing cards? 05
- Q2 A Write rules of differentiation. 05  
B Find the derivatives of the following with respect to x: 05  
(1)  $y = 3^x x^3 3^3$  (2)  $y = 3x^4 + 5x^3 - 2x^2 + 7x + 9$   
C If the demand function is  $x = 20 - 2p$ , find elasticity of demand when price is Rs. 2. 05

OR

- Q2 A Find the derivatives of the following with respect to x: 05  
(1)  $y = \log(\log x)$  (2)  $y = \sqrt{1-t^2}$  and  $x = 1 + t^2$   
B Find the equilibrium price using the following demand and supply function: 05  
(1)  $d = 20 - 4p$  and  $s = 10p - 8$  (2)  $d = 16 - 8p$  and  $s = 32p^2 + 8p$   
C The cost and revenue structure of a company is  $C(x) = 500 + \frac{1}{2} x^2$  and  $R(x) = 200x$  respectively. Find the production units  $x$  that will maximize the profit of the company. Also find the maximum profit. 05

- Q3 A Explain: ( 1) Simple Interest (2) Sinking Fund 05
- B Chhayya chemicals fixes a target of producing production 50,000 tons at the end 7 05  
years. If the production grows at a rate of 5 % per annum, find the present day  
production of the company.
- C Varsha limited purchased a machine for Rs. 5,00,000 on 1-1-2001. Its expected life 05  
is 12 years. After that period a new machine will cost 60% more. In order to  
provide for this, it was decided to create a sinking fund. On every 31<sup>st</sup> December a  
sum was to be invested at 14 % rate of compound interest. Find out the sum.

OR

- Q3 A Shreebhai deposited Rs. 15,000 with a leasing company at 11% rate of compound 05  
interest. What amount will he receive at the end of 5 years? How much interest  
will he get?
- B Rs. 4000 are invested for one year at 8% compound rate of interest and is 05  
calculated quarterly, what is the effective rate of interest?
- C The population of a city at present is 76,162 which was 65,673 before 5 years. Find 05  
out the rate of growth of population.

- Q4 A What is time series? State its components. 04
- B Discuss seasonal variation in detail. 05
- C Calculate trend values for the following by taking a three yearly moving averages 06  
by moving average method:  
Year: 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994  
Profit: 230 214 222 248 238 228 272 256 264 284 268 288 296 280

OR

- Q4 A Discuss uses of time series analysis. 04
- B Discuss graphical method to determine trend. 05
- C Calculate the seasonal indices for the following by simple average method: 06

YEAR	Q1	Q2	Q3	Q4
1997	37	41	33	35
1998	37	39	36	36
1999	40	41	33	31
2000	33	44	40	40

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