Business Mathematics-II

Time Allowed : 3 Hours

Maximum Marks :
Reappear : 90
Regular : 80

Note : ***Question No. 8 is compulsory.*** Attempt five questions in all, All questions carry equal marks.

Compulsory Question

1. (a) Fine the co-ordinates of the incentre of the triangle whose verticles are (4, 1), (1, 5) and (-2, 1).

   (b) Find the equation of the line, passing through the point (3, 4) and the sum of intercepts on the axis is 14.

2. (a) Find the equations of the lines through the point (4, 5) and making an angle of 45º, with the line
   $2x + 4y + 1 = 0$

   (b) Find the co-ordinates of the orthocentre of the triangle whose angular points are (1, 0), (2, -4) and (-5, -2).

3. (a) The sum of the first three consecutive terms of an A.P. is 9 and the sum of their squares is 35. Find the 20th term of this A.P.

(b) Find the sum of all natural less that 1000, which are neither divisable by 2 nor by 5.

(c) Find the A.P. whose first term is 2 and the sum of the first five terms is equal to one fourth of the next five terms.

4. (a) The 5th term of a G.P. is 16 and the 10th term is $\frac{1}{2}$. Find the 18th term of the G.P.

(b) The sum of three numbers x, y, z which are in G.P. is 56. Find x, y, z if x – 1, y – 7 and z – 21 are in A.P.

(c) Find the sum of the first n terms of the series :

$1.2 + 2.3 + 3.4 + \ldots\ldots\ldots\ldots$

5. (a) Evaluate the integral $\int \frac{dx}{x^3 - 1}$.

(b) Prove that $\int_0^{\pi/4} \log(1 + \tan x)\,dx = \frac{\pi}{8}\log 2$

6. (a) Evaluate the integral $\int \frac{dx}{(x-1)^2\sqrt{1-x^2}}$

(b) The marginal cost and marginal revenue functions for x units of a product of a firm are MC = 5 + 0.13x and MR = 18 respectively7. Compute the total profit if C(0) = Rs. 120.

7. (a) Prove that

$$\log 2 + 16 \log \frac{16}{15} + 12 \log + 7 \log \frac{81}{80} = 1$$

(b) Find the value of

$$\log \frac{(0.03)^{1/3}}{(0.003)^4}, \text{ if } \log 3 = .4771.$$

8. (a) Find the value of a if the distance between the points (2, 2) and (a, 2) is 5.

(b) Find the equation of the line passing through (5, 7) and parallel to the line $3x + 8y + 6 = 0$.

(c) Find the sum of the A.P.

$$5 + 10 + 15 + 20 + \ldots\ldots\ldots + 500.$$

(d) Find the sum of the series

$$\sqrt{2} - 2 + 2\sqrt{2} \ldots\ldots\ldots\ldots + 64\sqrt{2}$$

(e) Evaluate $\int_0^2 (x+1)^2 \, dx$

(f) Evaluate $\int x^2 \cos 2x \, dx$