* B A M - 2 3 0 1 *

BAM-2301 Seat No._____

M. Sc. (CA & IT) (Sem. II) Examination

March / April - 2014

201 : Mathematics - II

Time : **3** Hours] [Total Marks : **70**

1 (a) Evaluate the following : (any **three**) **9**

(i) Differentiate : $y = x^{\sqrt{x}}$.

(ii) Find dy/dx where $y = x^{\log x} + (\log x)^x$.

(iii) If $\log(x \cdot y) = x^2 + y^2$, find dy/dx.

(iv) If $y \cdot \log x = x - y$, prove that

$$dy/dx = \frac{\log x}{(1+\log x)^2}.$$

(b) Solve any three : **8**

(i) $\int x^2 \cdot e^{3x}\, dx$

(ii) $\int (x+2) \cdot (x+3)(2x-5)\, dx$

(iii) $\int e^{4x+5} dx$

(iv) $\int \frac{dx}{1-\cos x}$.

2 (a) Define the following terms : **4**

(i) Differential equation.

(ii) Linear differential equation.

(b) Solve : $\left(xy^2 + x\right)dx + \left(x^2y + y\right)dy = 0$. **4**

OR

(b) Solve : $dy/dx - y \cdot \tan x = e^x$. **4**

(c) Evaluate any three : **9**

(i) $(x + 8)\,dy + y\,dx = 0$.

(ii) If $y \cdot \log x = x - y$, prove that

$$dy/dx = \frac{\log x}{(1 + \log x)^2}.$$

(iii) $\left(e^x + 1\right)y\,dy = (y + 1) \cdot e^x dx$.

(iv) $dy/dx = (4x + y + 1)^2$.

3 (a) Explain the following terms : **6**

(i) Distance between two points.

(ii) Co-ordinates of a centroid.

(iii) Slope of line $ax + by + c = 0$, $a^2 + b^2 \neq 0$.

(b) Find the condition that the point (x, y) may lie on the line joining (3,4) and (–5,6). **4**

OR

(b) If the distance between $(a,3)$ and $(4,2)$ is 37. Find the value of a. **4**

(c) Evaluate any two : **8**

(i) Find the equation of the line passing through the point (5,2) and making equal intercepts with opposite sign on the axes.

(ii) Show that the line joining (2,–3) and (–5,1) is perpendicular to the line joining (4,5) and (0,–2).

(iii) Find the co-ordinates of the circumcentre of a triangle whose co-ordinates are (3,–2), (4,3) and (–6,5). Hence find the circum radius.

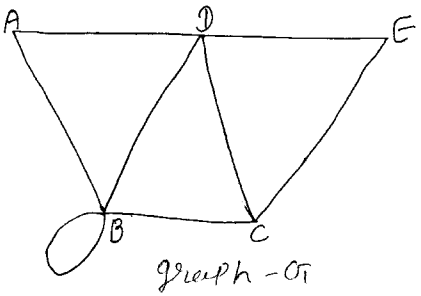
4 (a) Define the following terms : **6**

(i) Sum of product farm expression

(ii) Loop

(iii) Walk

(b) Determine the following for given graph G. **4**



graph - G1

(i) The set V(G) of the vertices of G.

(ii) The set E(G) of edges of G.

(iii) The degree of each vertex.

(iv) All possible paths from A to E.

(c) Do as directed : **8**

(i) Prove : $a + (a * b) = a$.

(ii) In $f = a'b + b'c + ca'$, the find f' and check $f + f' = 1$.

(iii) Convert the given Boolean expression into complete DNF.

$E = x \cdot z' + y'z + x \cdot y \cdot z'$