Roll No. ☐☐☐☐☐☐☐☐☐☐

B.Sc.(PCM)-9, B.A.(Math)-3
2nd Year Examination, Academic Batch 2016
Mathematics-III (Analysis)

Time : 3 Hours]   *[Max. Marks : 100*

Note. *Attempt any **five** questions. All questions carry equal marks.*

Q.1   Find the envelope of the family of straight line $Y=mx+a/m$ **[20]**

Q.2   Show that $\int_0^1 dx/\sqrt{(-\log x)} = \sqrt{\pi}$ **[20]**

Q.3   Examine whether or not the function.   **[20]**
$$F(x)= \begin{cases} \sin 2x/x & , \text{ when } x \neq 0 \\ 2 & , x=0 \end{cases}$$
is continuous at x=0

Q.4   If $u=y^2/2^x$, $v=x/2+y^2/2^x$ find $\partial(u,v)/\partial(x,y)$.   **[20]**

Q.5   Evaluate $\int_0^3 \int_1^2 xy(1+x+y)dxdy$.   **[20]**

Q.6   If $x^x+y^y+z^z=c$ show that at x=y=z   **[20]**

$\partial^2 z/\partial x^2 y = -[x\log x]^{-1}$

Q.7   Show that $\lim xy^3/x^2+y^2$ does not exist.   **[20]**

Q.8   Find the maximum and minimum value of $xy(a-x-y)$.   **[20]**