Printing Page(s) : 1 **Paper Code :DSC-201**

Roll No. | | | | | | | | | | |

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

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

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

Q.1 Prove that $\int_0^\infty xe^{-\alpha x}\sin\beta x dx = \frac{2\alpha\beta}{(\alpha^2+\beta^2)}, \alpha > 0$

Q.2 Find the minimum and maximum values of the function $x^3y^2(1-x-y)$.

Q.3 Evaluate $\int_1^2\int_0^x \frac{1}{(x^2+y^2)}dxdy$

Q.4 Show that $\int_0^2\int_0^{y/2} ydydx = \int_1^2\int_0^{x/2} xdxdy$.

Q.5 If $x = r\sin\theta\cos\phi,\ y = r\sin\theta\sin\phi,\ z = r\cos\theta,$ **then** show that $\frac{\partial(x,y,z)}{\partial(r,\theta,\phi)} = r^2\sin\theta.$

Q.6 Find the evaluate of the hyperbola $x^2/a^2 - y^2/b^2 = 1$

Q.7 Find the envelope of the family of straight lines $y = mx + \frac{a}{m}$, the parameter being m.

Q.8 Show that the functions $f(x,y) = \frac{xy^3}{x^2+y^6}$, $x \neq 0, y \neq 0$ and $f(0,0)=0$ is not continuous at $(0,0)$ in (x,y).