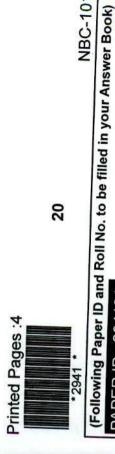
- Attempt any two of the following: 5
- theorem Using Green's

 $10 \times 2 = 20$ 

evaluate  $\int_{\mathcal{C}}[(y-\sin x)dx+\cos x.dy]$  where C is the plane

triangle enclosed by the lines 0, x = T1/2 and  $y = \frac{2x}{\pi}$ 

- (b) Verify stoke's theorem for  $F=(x^2+y^2)$  I-2xyJ taken around the rectangle bounded by the lines  $x = \pm a, y = 0, y = b.$
- (c) State & Prove Leibrity theorem.



NBC-101

(Sem. -I) CARRY OVER THEORY MCA (Dual Degree) Roll No. PAPER ID: 294101

## **EXAMINATION,2015-16 MATHMATICS-I**

Time: 3 Hours

[Total Marks: 100

Note: Attempt all questions. All questions are compulsory.

Answer any four of the following:

5×4=20

(a) Ig  $y = \log(x + \sqrt{1 + x^2})$ . Find  $\frac{d^2y}{dx^2}$ 

(b) Find characteristics roots of the matrix.

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 $\Xi$ 

[Contd...

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- (c) Expand sin x in power.
- (d) Write short note on Caley- Hamilton theorem.
- (e) Find eigen value is A.

$$\begin{array}{cccc}
1 & 0 & -1 \\
1 & 2 & 1 \\
2 & 2 & 3
\end{array}$$

- (f) Find the area between curve.  $y^2 = 4ax & x^2 = 4ay$
- Attempt any four of the following:

2

5×4=20

(a) Evaluate 
$$\int_0^{\pi/2} \int_0^{\pi/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx dy$$

(b) If then.  $f(x,y) = x^3 + y^3 + xy$  find  $t^2 - s^2$ 

(c) Evaluate 
$$\lim_{x\to 1} \frac{x^5 - x^2}{x^4 - 2x^3 + 2x - 1}$$

- (d) if  $z = u^2 + v^2$  and  $u = at^2$ , v = 2at find  $\frac{dz}{dt}$
- (e) Evaluate  $\int_{-1}^{1} \int_{-2}^{2} \int_{-3}^{3} dx.dy.dz$

(f) Write short note on Taylor's series.

10×2=20

- Attempt <u>any two</u> of the following:
- (a) If  $\vec{r} = xi + y\hat{j} + z\hat{k}$  and r = |r| show that div  $\frac{\vec{r}}{|\vec{r}|^3} = 0$
- (b) Find the area enclosed by the pair of curve.

$$y = 2 - x & y^2 = (2 - x)$$

(c) Evaluate:  $\iiint_R (x-2y+z) dx dy dz$ 

Where 
$$R=0 \le x \le 1$$
,  $0 \le y \le x^2$ ,  $0 \le z \le x+y$ 

Attempt any two of the following:

tha

10×2=20

- (a) Prove  $\nabla x(\overline{F}x\overline{G}) = F(\nabla .\overline{G}) \overline{G}(\nabla .\overline{F}) + (\overline{G}.\nabla)\overline{F} (\overline{F}.\nabla)\overline{G}$
- (b) Find the inverse of matrix Elementary Transformation.

(c) Varify Cayley's Hamilton theorem.

(3)

[Contd...

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