

V.P.M's B. N. Bandodkar College of Science, Thane  
F.Y.J.C First Terminal Examination November 2018  
Subject: Mathematics & Statistics

Date: 26.11.2018  
Day: Monday

Time: 08.00 am to 10.00 am  
Marks: 50

- Note: 1) All questions are compulsory.  
2) The question paper consist of 19 questions divided into four sections A, B, C, D.  
3) Section A contains 4 MCQ questions of 1 mark each.  
Section B contains 5 questions of 2 marks each.  
Section C contains 4 questions of 3 marks each.  
Section D contains 6 questions of 4 marks each.  
4) Use of logarithmic tables is not allowed.  
5) Use of Calculator is not allowed.  
6) In LPP only rough sketch of graph is expected. Graph paper is not necessary.

Section - A

(04)

- In  $\Delta ABC$ ,  $m\angle A = \frac{2\pi^c}{3}$  and  $m\angle B = 45^0$  then  $m\angle C$  in degrees is  
a)  $25^0$                       b)  $15^0$                       c)  $35^0$                       d)  $5^0$
- If  $\log(3x + 2) - \log(3x - 2) = \log 5$  then the value of  $x$  is  
a)  $-1$                       b)  $1$                       c)  $\frac{2}{3}$                       d)  $\frac{-2}{3}$
- The value of the  $\begin{vmatrix} 3 & -1 & -2 \\ 0 & 0 & -1 \\ 3 & -5 & 0 \end{vmatrix}$  is  
a)  $-12$                       b)  $-10$                       c)  $12$                       d)  $14$
- The value of 'a' if the point  $(-6, 3)$  lies on the locus  $x^2 = 4ay$  is  
a)  $-3$                       b)  $2$                       c)  $3$                       d)  $-2$

Section - B

(10)

- Find the length of an arc of circle which subtends an angle of  $108^0$  at the centre, if the radius of the circle is 15 cms.
- Prove that:  $\frac{1}{\log_{ab} abc} + \frac{1}{\log_{bc} abc} + \frac{1}{\log_{ca} abc} = 2$
- If ' $\omega$ ' is the complex cube root of unity, find the value of

$$(1 - \omega - \omega^2)^3 + (1 - \omega + \omega^2)^3$$

OR

- Express  $\frac{(2+i)}{(3-i)(1+2i)}$  in the form of  $a + ib$ ,  $a, b \in R$  &  $i = \sqrt{-1}$ , state the value of  $a$  &  $b$ .
- If  $A \equiv (-3, 2)$  and  $B(1, -4)$ , find the equation of the locus of point P, such that  $3PA = 2PB$

