PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2018
(Third Semester)

Branch - **MATHEMATICS WITH COMPUTER APPLICATIONS**

CLASSICAL ALGEBRA & TRIGONOMETRY

Time : Three Hours Maximum : 75 Marks

SECTION-A (20 Marks!

Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 x 2 = 20)

1 Frame the quadratic equation if one of the root is 1 - V3L

2 If *a,* p, y are the roots of the equation $x^3 + px^2 + qx - r = 0$, find the values of Ea^2.

3 Find the limit of $a_n = \frac{}{2n+1}$.

4 State comparison test for convergence.

5 ' Test for convergence of the series $\pounds\frac{}{R}, x > 0$.

6 State D'Alembert's ratio test.

7 Write the expansion cosnB in powers of sinO and cos0,n being a positive integer.

8 . Prove that sinh2x = 2 sinhx coshx.

9 Write the formula to find the principal value of log (a + ib), a, b are real.

10 Prove that $\sim Yz'Vi + Ys'\backslash\sim$.....= $\tan^{-1}$ (^2)

SECTION - B (25 Marks)

Answer **ALL** Questions

- **ALL** Questions Carry **EQUAL** Marks (5 x 5 = 25)

11 a Solve the equation $3x^3 - 23x^2 + 72x - 70 = 0$, given that 3+ V-5 is a root.

OR

b Find the value of K for which the roots of an equation $2x^3 + 6x^2 + 5x + k = 0$ are in arithmetic progression.

12 a Prove $\sim(\frac{}{2n+3}$ i is monotonically increasing.

OR

b Test for convergence the series $\frac{Yn!}{n}$.

13 a Test the convergence of the series $\sum \frac{1}{(1+n)^n}$

OR

14 a Express sin70 interms of sin0.

OR

b If -1911 prove that the angle of 0 is 1°58' nearly.
0 5046 F

15 a Find the expansion for log(l + i).

OR

b Find the sum to n terms of the series
cosa + cos5a + cos9a + ...

SECTION - C (30 Marks)

Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 1 0 = 30)

16 Solve $x^5 + x^4 + x^3 + x^2 + 4x + 1 = 0$.

17 Test the convergence of the series

$$\frac{1.2}{3.4.5} 1\frac{2.3}{4.5.6} i \frac{3.4}{5.6.7} (\blacksquare ..$$

18 Test for convergence of the series $S \frac{1.3.5.....(2n-1)}{2.4.6..... 2n}\ y^{n}$

19 Prove that $\sin^4 0 \cos^3 0 = 1/64 (\cos 70 - \cos 50 - 3\cos 30 + 3\cos 0)$.

20 Prove that the real part of the principal value of $i^{\log(\wedge 1+1}$Ms

$e^{\frac{-7c^2}{8}} . \cos(7t/4 \log 2)$.

Z-Z-Z END