Reg.No : | | | | | | | | | | | |

D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE – 1

SEMESTER EXAMINATIONS

NOVEMBER – 2017 **15CMA1B**

TRIGNOMETRY

Time: 3 Hrs **Max. Marks: 75**

SECTION – A (10 X 2 =20)

Answer ALL the questions.

1. Write down the expansion of tan nθ interms of tan θ.
2. Prove that: cos 3θ=4 cos^3 θ-3 cos θ.
3. If Z=cos θ+i sin θ then prove that z^n+$\frac{1}{z^n}$ = 2cos nθ.
4. Expand (x$-\frac{1}{x}$)^7.
5. What is the addition formula for cosh(x+y).
6. Prove that tanh^{-1}x= $\frac{1}{2}$ log ($\frac{1+x}{1-x}$).
7. Find Logi.
8. Prove that 1$-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}$+…= $\frac{\pi}{4}$.
9. Give Gregory's series.
10. State Eulers series formula.

SECTION – B (5 X 5 =25)

Answer any FIVE of the following questions.

11. Prove that $-2^5 sin^6\theta = cos6\theta - 6cos40 + 15cos20 - 10$.
12. Solve: sin ($\frac{\pi}{3}$ + x) =0.87.
13. Evaluate$\lim_{x\to 0} \frac{\tan 2x - 2\tan x}{x^3}$.
14. If tan ($\theta + i\varphi$) =x +iy then prove that x^2 +y^2 +2x cot 2θ=1.
15. Show that log $_i$ i= $\frac{4n+1}{4m+1}$, where m and n are integers.
16. If tan (x + iy)=u + iv Prove that $\frac{u}{v} = \frac{\sin 2x}{sinh 2y}$
17. Show that π =2$\sqrt{3}$ {1 $-\frac{1}{3^2}+\frac{1}{5}\cdot\frac{1}{3^2}-\frac{1}{7}\cdot\frac{1}{3^3}$+….}.
18. Sum to n terms of : tan^{-1} $\frac{1}{1+1+1^2}$ + tan$^{-1}\frac{1}{1+2+2^2}$ + tan^{-1} $\frac{1}{1+3+3^2}$.

SECTION – C (3 X 10 =30)

Answer ALL the questions.

19. a) Prove that : cos 8θ =128 sin ^{8} θ-256 sin ^{6} θ+160 sin ^{4} θ-32 sin ^{2} θ +1.

(Or)

b) Prove :$\frac{\sin 7\theta}{\sin \theta}$ =64 cos^6 θ-80 cos ^{4} θ+24 cos^2 θ-1.

20.a)Prove that :sin$^4\theta$ cos$^3\theta$=$\frac{1}{64}$ [cos 7θ-cos 5θ-3cos 3θ+3cosθ].

(Or)

b) If cos(x+iy)=r(cosα+isinα), prove that y=$\frac{1}{2}$ log [$\frac{\sin(x-\alpha)}{\sin(x+\alpha)}$].

21.a) If log sin(x+iy)=$\alpha + i\beta$ show that

i) $2e^{2\alpha}$ =cosh 2y-cos 2x.

ii) Cos$(x-\beta) = e^{2y}\cos(x+\beta)$

(Or)

b) Prove that sum of the series

$$1 - {}^{1}/_{2}\ cos\theta + \frac{1.3}{2.4}\ cos2\theta - \frac{1.3.5}{2.4.6}\cos 3\theta \ldots\ldots\ \infty = \frac{{}^{cos\theta}/_{4}}{\sqrt{2\ cos{}^{\theta}/_{2}}}$$

* * * * * * *