APPLIED MATHEMATICS-I
1st Exam/Common/2455/0251/5402/ Nov'15

Duration 3 hrs: **M.Marks: 75**

Section A

Q 1 (15 marks)

A. **Choose the correct one:**

I. Number of terms in expansion of $(1-2x)^{-9}$ are
a. 9 b. infinite c. -10 d. 11

II. The value of SinA = $\frac{1}{2}$ then Sin 3A =
a. 0 b. 1 c. -1 d. 2

III. The modulus of $\sqrt{3} + i$
a. 2 b. 1 c. -2 d. 0

IV. Latus rectum of parabola y^2-8y-x+19=0
a. 4a = 1 b. 4a = 2 c. 4a = 3 d. a = 1

V. 310 is a term of AP 3,8,13,18,.....
a. 14^{th} b. not a term c. 7^{th} d. 8^{th}

B. State whether the following statements are true or false:

I. The radius of circle X^2+Y^2-8X-16Y+78=0 is $\sqrt{2}$.

II. The number ways of selecting 6 players out 7 is $^7P_6$.

III. The value of x-radian in degrees is $\frac{180X}{\pi}$

IV. If K, K+1, K+3 are in GP then K=2.

V. The co-ordinates of middle point of the line joining (3,4) and (-5,6) are (-1,-1).

C. Fill in the blanks:

I. The value of $\cos 53^o \cos 37^o - \sin 53^o \sin 37^o$ is equal to ----------

II. The value of $\frac{5!}{4!}$ =

III. Natural logarithmus are known ----------.

IV. The conic is ellipse if ----------.

V. Value of $\cos \frac{\pi}{2} + i \sin \frac{\pi}{2}$ = ----------.

Section B

Q2. Attempt any six questions (5x6)

I. Prove that $\tan 28° = \frac{\cos 17° - \sin 17°}{\cos 17° + \sin 17°}$

II. Prove that $7 \log {}^{10}/_{9} - 2 \log {}^{25}/_{24} + 3 \log {}^{81}/_{80} = \log 2$

III. Find absolute term in expansion of $\left(x + \frac{1}{x}\right)^{10}$.

IV. Sum the series $31 + 29 + 27 + ------ + 3$

V. The sum of first three terms of a GP is 21 while the sum of next three terms is 168. Find first term and common ratio.

VI. Show that $\tan 65° = \tan 25° + 2 \tan 40°$

VII. Two vertices of triangle are (4,-6) and (2,-2) and its centroid is (8/3,-1). Find third vertex.

VIII. Find equation of the straight line parallel to 2x+3y+11=0 and which is such that sum of its intercepts on the axis is 15.

IX. Find the ratio in which the line joining (3, -6) and (-6, 8) is cut by x-axis.

Section C

Note: Attempt any three questions (10x3)

3. If x is so small that its square and higher powers are neglected.
   Show that $\frac{\sqrt{9+7x}-(16+3x)^{1/4}}{(4+5x)} = \frac{1}{4} - \frac{17x}{384}$
4. Find equation of the straight line passing through the intersection of x+2y+3=0 and 3x+4y+7=0 and perpendicular to line y-x=9.
5. Resolve into partial fraction $\frac{3x+7}{(x+3)(x^2+1)}$
6. Prove that cos 20° cos 40° cos 60° cos 80° $= \frac{1}{16}$
7. A ladder 20 m long reaches to a distance 20 m from the top of flag staff. At the foot of ladder the elevation of the top is 60^0. determine the height of flag staff.
8. Find equation of circle passing through points (4, 2) and (-6,-2) and has its centre on x-axis.