Seat No.: _____   Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
B. Pharm. - SEMESTER– I, EXAMINATION – SUMMER-2016

Subject Code: 210006   **Date: 07/06/2016**
Subject Name: Elementary (Remedial) Mathematics
Time: 02:30 PM to 05:30 PM   **Total Marks: 80**
Instructions:
1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Solve the following equations.   **06**

1) $2x\ (x - 7) = 3\ (2 - x)$

2) $5x^2 - 2x - 4 = 0$

(b) Prove the following trigonometric identity   **05**

$(1 + \cot \theta)^2 + (1 - \cot \theta)^2 = 2 \cosec^2 \theta$

(c) Find $\frac{dy}{dx}$, if $x = a\ (\theta + \sin \theta)$, $y = a\ (1 - \cos \theta)$ **05**

Q.2 **(a)** A card is drawn at random from a pack of 52 cards. What is the probability that the card is a spade or a king?   **06**

(b) There are two boxes A and B containing 4 Aspirin, 3 Analgin and 3 Aspirin, 7 Analgin. A box is chosen at random and a tablet is drawn from it. If the tablet is an Aspirin, find the probability that it is from box A.   **05**

(c) Calculate the mean and standard deviation for the following table giving the age distribution of 542 members.   **05**

Age in years	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. Of members	3	61	132	153	140	51	2

Q.3 **(a)** i) Show that the points (1, 1), (-2, 7) and (3, -3) are collinear.   **06**

ii) If the distance between A(5, a) and B(2, 6) is $3\sqrt{2}$, find the value of a.

(b) Find the equation of locus of a point which moves such that it remains equidistance from the points A(3, -1) and B(4, 2).   **05**

(c) Find the equation of the perpendicular bisector of the line segmnt joining the points A(2, 3) and B(6, -5).   **05**

Q.4 **(a)** Find the value of following i) $_{11}P_3$ ii) $_6P_2$ x $_7P_2$.   **06**

(b) Find m and n if $(m + n)\ P_2 = 56$ and $(m-n)\ P_2 = 12$.   **05**

(c) In how many ways can the letters of REARRANGE be permuted?   **05**

Q.5 **(a)** A club has 14 male and 16 female members. A committee Composed of three women is formed. In how many ways can this be done? **06**

(b) Evaluate $\lim_{X\to 2} \frac{4(x^2-4)}{x-2}$. **05**

(c) Find the value of $(19)^4$ and $(999)^4$. **05**

Q. 6 **(a)** Integrate the following functions with respect to x **06**

i) $2x - 3\cos x + e^X$ ii) $\frac{\cos x}{\cos x - 1}$

(b) Evaluate $\int \frac{2x+1}{\sqrt{x^2-2x+5}}$. **05**

(c) Evaluate $\int_0^{\frac{\pi}{2}} \log \sin x\, dx$. **05**

Q.7 **(a)** Solve the following simultaneous equations using Cramer's rule. **06**

$$x + y + z = 4$$
$$2x - 3y + 4z = 33$$
$$3x - 2y - 2z = 2$$

(b) A population grows at the rate of 8% per year. How long does it take for the population to double? **05**

(c) Find the tenth term of a geometric progression whose third term is 16 and whose seventh term is 1. **05**

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