1.Prove that $\vec{a} = 5\hat{i} + 15\hat{j}$ and $\vec{b} = 3\hat{i} + 9\hat{j}$ are parallel, if the position vectors of the points A and B are $7\hat{i} + 3\hat{j} + \hat{k}$ and $2\hat{i} + 5\hat{j} + 4\hat{k}$ respectively, then find the magnitude of $\vec{AB}$

2. Find the value of $\int \frac{cos(logx)}{x} dx$

3. In which radio does the YZ plane divide the line joining the points (-2,4,7) and (3,-5,8)

4. Resolve $\frac{13x + 18}{2x^2 + 5x + 3}$ into partial fractions

5. Find the coefficient of $\sqrt{tan\sqrt{x}}$

6. The side of a square sheet of metal is increasing at the rate of 5cm/minute. At what are its area increasing when the side is 20cm long?

7. Prove that correlation coefficient is the geometric mean of the regression coefficiens

8. Solve the Differential equation $(x - 1\frac{dy}{dx}) = 2x^3y$

9. A card is drawn at random from a well shuffled pack of 52 cards. Find the probability that it is neither an ace nor a king.

10. Find the vector equation of the sphere with centre $(\hat{i} + 2\hat{j} - 3\hat{k})$ and radius 5 units

11. Find the value of $\int xsinxdx$

12. The edge of a cube is increasing at the rate of 7cm/sec. How fast is the volume of the cube increasing when the edge is 10 cm long?

13. Find 2 positive numbers whose product is 64 and the sum is minimum

14. Tickets are marked from 1 to 16 and mixed up. One ticket is taken out at random. Find the probability of its being a multiple of 2 or 3.

15. Prove that the points (1,2,3), (3,0,3), (-2,-3,-3) and (3,4,6) are coplanar

16. Prove that $\vec{AB} + \vec{BC} + \vec{CA} = 0$

17.

17.   Evaluate $\int \dfrac{1}{1 - 4x} dx$

18.   Find the differential coefficient of sinx by first principle

19.   If the edge of a cube is increasing at the rate of 5cm/sec., find the rate of increasing of its volume when its edge is 8cm long?

20.   Write a theorem of total probability and prove it.