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Tertiary and Vocational Education Commission		
NVQ Level 05 –Semester I		
Diploma in Quantity Surveying		
Mathematical Concepts in Quantity Surveying	F45C002M01	Three Hours
Answer any 05 questions.		

Question No 01

- Solve the following equations
 - $x^2 + 3x + 2 = 0$
 - $2x^2 - 5x - 9 = 0$ (06 marks)
- Two friends A & B live 240 km apart. One day they planned to visit each other. To prevent driving so far, they agreed to leave at the same time, drive towards each other, &
- meet somewhere along the route. A tends to drive carefully & obeys the speed limit. His average rate of speed is 70 kmph. B drives too fast, & his average rate of speed is 80 kmph. How long will it take A & B to meet each other (08 marks)
- Solve the inequality: $y^2 - 8y - 10 \geq 0$ (06 marks)

Question No 02

- From a window 5 m above the ground a man notices that the angle of depression of the foot of the building across the road is 26° & the angle of elevation of the top of the same building is 32° . Find the height of the building & width of the road assuming that the road to be horizontal. (06Marks)
- Use cosine rule to find the angles of the triangle whose sides are 8 cm, 6 cm & 5 cm. (06Marks)
- A farmer has an adjustable electric fence that is 100 m long. He uses this fence to enclose a rectangular grassing area on three sides & the forth side is a fixed wall. Find the maximum area he can enclose using second derivative. (08Marks)

Question No 03

- Evaluate (05 Marks)

$$\int_{0.2}^{1.4} (xe^{2x}) dx$$
- Approximate the integral in part 1.) using,
 - Mid –ordinate rule
 - Trapezoidal rule
 - Simpson rule
 Determine the error in each case (15 Marks)

Question No 04

X (cm)	10	30	50	70	90	110	130	150	170
Y (cm ²)	120	124	127	139	142	145	134	158	160

Find the approximate volume using;

- Simpson's rule
- Trapezoidal rule

(20 Marks)

Question No 05

- Let A & B be two events such that $P(A) = 0.6$, $P(B) = 0.3$ & $P(A \cup B) = 0.8$

Find, $P(A|B)$, $P(B|A)$, $P(A' \cap B)$ & $P(B|A')$ (08 Marks)

- For an MCQ question with 5 answers, a student either knows the answer or guesses. Probability of knowing the answer is 0.7.

- If he has answered correctly for a certain question, what is the probability that he had known the answer before (12 Marks)

Question 06

A machine produces metal bolts of nominal diameter 35 mm. The diameters of 50 bolts are measured with the following results.

Diameter (mm)	Frequency
33.3 - 33.7	03
33.8 - 34.2	08
34.3 - 34.7	12
34.8 - 35.2	14
35.3 - 35.7	10
35.8 - 36.2	03
Total	50

- Find the class boundaries of each class & prepare a percentage cumulative frequency table
- Draw a cumulative frequency curve
- Find the median diameter using the diagram in part b) (20 Marks)