UNIVERSITY OF KERALA

SCHOOL OF DISTANCE EDUCATION

ASSIGNMENT QUESTIONS

B.Sc. Mathematics (Semester 3)

Algebra and Calculus - I

1. Examine whether $[f(a)]^{-1} = f(a)$, when f is a homomorphism.
2. Find the exponent g_0 of G and verify $a^{g_0} = 1$ for al a in G
   i) U_{14}, the group of units in $Z/7Z$
   ii) U_{16}, the group of units in $Z/7Z$
3. Solve the system if possible,
   $x \equiv a_1 (\mathrm{mod}\, m_1); x \equiv a_2 (\mathrm{mod}\, m_2);\ x \equiv a_3 (\mathrm{mod}\, m_3)$ where $(a_1, a_2, a_3) = (2,3,5)$ and $(m_1, m_2, m_3) = (9,10,11)$.
4. Determine whether $\vec{u}$ and $\vec{v}$ make an acute, an obtuse angle or orthogonal. $\vec{u} = \langle 4,1,6 \rangle$ and $\vec{v} = \langle -3,0,2 \rangle$.
5. Consider the parallelepiped with adjacent edges:
   $\vec{u} = 3\vec{i} + 2\vec{j} + \vec{k}$
   $\vec{v} = \vec{i} + \vec{j} + 2\vec{k}$
   $\vec{w} = \vec{i} + 3\vec{j} + 3\vec{k}$
   a) Find the volume.
   b) Find the area of the face determined by $\vec{u}$ and $\vec{w}$
   c) Find the angle between $\vec{u}$ and the plane containing the face determined by $\vec{v}$ and $\vec{w}$.
6. Find the acute angle of intersection of the planes to the nearest degree $x + 2y - 2z = 5$ and $6x - 3y + 2z = 8$
7. Find the domain of $\vec{r}(t)$ and the value of $\vec{r}(t_0)$ for $\vec{r}(t) = \cos t\, \vec{i} - 3t\, \vec{j}$ at $t_0 = \pi$
8. Find a vector equation of the line tangent to the graph of $\vec{r}(t)$ at the point p_0 on the curve $\vec{r}(t) = t^2\, \vec{i} - \frac{1}{t+1}\, \vec{j} + (4 - t^2)\vec{k}$ where $p_0 = (4,1,0)$
9. Evaluate the indefinite integral $\int \langle te^t, \log t \rangle dt$.
10. i) Use formula to find $k(t)$ for the curve $\vec{r}(t) = t\, \vec{\mathrm{i}} + \frac{1}{2}t^2\, \vec{\mathrm{j}} + \frac{1}{3}t^3\, \vec{\mathrm{k}}$.
    ii) $\vec{v}$ and $\vec{a}$ are given at a certain instant of time. Find a_τ, a_N, τ and N at this time for $\vec{v} = 3\vec{i} - 4\vec{k}$; $\vec{a} = \vec{i} - \vec{j} + 2\vec{k}$

COST ACCOUNTING

ASSIGNMENT QUESTIONS

1. What do you understand by cost accounting? What is its significance? Discuss the important step for the installation of a costing system in a manufacturing concern.

2. The components A and B are used as follows:

Normal usage….300 units per week each

Maximum usage….450 units per week each

Minimum usage….150 units per week each

Reorder Quantity….A - 2,400 units; B - 3,600 units.

Reorder period….A - 4 to 6 weeks, B – 2 to 4 weeks

Calculate for each component

(a) Re-order Level
(b) Minimum Level
(c) Maximum Level
(d) Average Stock Level

3. Prepare a report stating the different methods of wage payment and its relative merits and demerits.

4. Discuss cost sheet. Prepare a cost sheet using imaginary figures.

Statistics Assignment (Third Semester)

1. Fit a normal distribution of the following data.
   Class: 21-24 25-28 29-32 33-36 37-40.
   Frequency: 4 8 12 10 6.

2. If X has uniform distribution in (0,1). Find the pdf of Y =-2logX.

3. A symmetric die is thrown 600 times. Find the lower bound for the probability of getting 80 to 120 sixes.

4. Show by using central limit theorem that if X follows binomial distribution with parameters n, p. Its distribution will tend to the normal as $n \to \infty$..
5. Show that Poisson distribution as the limiting form of the Binomial distribution.

6. The scores in a test follow the normal law with mean 60 and standard deviation 10. Find the percentage of students scoring

   1. Above 75.
   2. Between 65 and 75.
   3. Between 48 and 70.
   4. Below 40.

7. Two independent samples from a normal population gave means 80 and 78 with sum of squares of deviations from the means 6000 and 15360. If the samples where of sizes 6 and 10 due to think that the di erence observed has probability less than 0.05?

8. Show that the sample mean is an unbiased estimate of the population mean?

9. If 6, 11, 4, 8, 7, 6 is a sample from a normal population the mean 3. Find the maximum likelihood estimate of the variance σ^2?

10. Find the Cramer-Rao lower bound for the variance of any unbiased estimate of ; where is the parameter of a Poisson distribution?

WRITING AND PRESENTATION SKILLS
EN 1311.1 Language Course VI (BA/ BSc English IV) &
EN 1311.2: Language Course V (BCom)

ASSIGNMENT (eight to ten pages)

1. Write an essay on the Mechanics of Writing.
   Or

2. The process of writing from creating an outline to preparing a final draft.
   (10 marks)

CASE ANALYSIS (five pages)

1. What are the features of a paragraph?
   Or

2. Create the content for a 15 to 20 slides on water conservation. (10 marks)