Enroll No. _____

Shree Manibhai Virani and Smt. Navalben Virani Science College (Autonomous)
Affiliated to Saurashtra University, Rajkot

SEMESTER END EXAMINATION NOVEMBER – 2016

B.Voc. Chemical Technology

BVCT-103 - ELEMENTARY PHYSICS AND MATHEMATICS

Duration of Exam – 3 hrs ***Semester – I*** ***Max. Marks – 70***

PART-1 : PHYSICS

Que. 1 (A) Answer the following Questions **[05]**

1. Define, Electric field.
2. What is unit of capacitance?
3. State Snell's law.
4. Define interference.
5. What is refraction of light?

Que. 1 (B) Answer the following Questions **[10]**

1. Give types of magnetic materials.
2. What are magnetic permeability and susceptibility?.
3. Define Young Modulus and Bulk Modulus.
4. Write laws of reflection.
5. Draw a ray diagram for the image formation, when object placed beyond radius of curvature (R) against convex lens.

Que. 2 Answer the following Questions (Any Four) **[20]**

1. State Coulombs law and explain.
2. Write a short note on Gauss theorem.
3. Derive mirror formula.
4. What is interference? Explain Young's double slit experiment.
5. Derive formula for the resistance in (i) series, (ii) parallel.
6. State laws of (i) Reflection and (ii) Refraction.

PART-2 : MATHEMATICS

Que. 3 (A) Answer the following Questions **[05]**

1. Differentiation of ln x is _____.
2. 1° =_____radians.
3. $\int e^{x} dx$ =_____.
4. If $\vec{A} \bullet \vec{B} = 0$,then angle between $\vec{A}$ and $\vec{B}$ is _____.
5. $\sin(-^{-})$ =_____.

Que.3 (B) Answer the following Questions **[10]**

1. Solve $\int \frac{1}{x^2} dx$.
2. Find the value of 60 degree in radians.
3. $\cos 360^{\circ}$ =_____while $\sin 360^{\circ}$ =_____.
4. Evaluate $\int \sin x \cos x dx$.
5. If $y = \sin x$ then find $\frac{dy}{dx}$.

Que.4 Answer the following Questions(Any four) **[20]**

1. Find the area of circle having radius "a" and equation $x^2 + y^2 = a^2$.
2. Write the applications of integral calculus.
3. Explain different types of errors in numerical compilations.
4. If $y = \frac{e^{2x}}{\sin x}$ then find $\frac{dy}{dx}$.
5. Using Gauss Elimination find values of x, y and z from following equations:

$$x + 2y + 3z = 26$$
$$2x + 3y + z = 34$$
$$3x + 2y + z = 39$$

Find cross product and angle between $\vec{A}$ and $\vec{B}$, $\vec{A} = i + j - 3\hat{k}, \vec{B} = 3i + 3j - \hat{k}$

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