KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY
DEEMED TO BE UNIVERSITY, BHUBANESWAR – 24
(Decld. U/S 3 of UGC Act, 1956)
OFFICE OF THE CONTROLLER OF EXAMINATIONS

Mid-Semester Examination (Autumn Semester, 2023–2024)

Subject Name & Code: Scientific & Technical Writing (EX20003) **Applicable to Courses:** B. Tech. 3rd Sem

Full Marks: 40 **Time:** 1.5 Hours

Answer either **PART I** or **PART II** questions, as directed.

Attempt **PART I** if you belong to one of the following Schools of Engineering and Sections:

School of Computer Engineering: IT – 1, 2, and 3, CSE – 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 40, 41, 42, CSSE – 1, CSCE – 1 and 2;
School of Electronics Engineering: ETC – 1, 2, and 3, EEE

Attempt **PART II** if you belong to one of the Schools of Engineering and Sections :

School of Computer Engineering: IT – 4 and 5, CSE – 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, and 55, CSSE 2, CSCE 3;
School of Electronics Engineering: E&CSE – 1, 2, 3, 4, and 5;
All sections of **School of Mechanical Engineering, School of Civil Engineering**, and **School of Electrical Engineering**

PART I

SECTION A
(The question has five parts. Answer all parts of the question. Each part carries 2 Marks, Total Marks: 10)

Question No	Question	Learning levels as per Bloom's taxonomy	CO Mapping
1(a)			CO 1
1(b)			CO 1
1(c)			CO 2
1(d)			CO 3
1(e)			CO 3

SECTION B
Each question has two parts. Answer BOTH parts of Any THREE questions. Total Marks: 30

Question No.	Question	Marks	Learning levels as per Bloom's taxonomy	CO Mapping
2 (a)		6		CO 1
2 (b)		4		CO 1
3 (a)		6		CO 2
3 (b)		4		CO 2
4 (a)		6		CO 3
4 (b)		4		CO 3
5 (a)		6		CO 2
5 (b)		4		CO 2

PART II
SECTION A
The question has five parts. Answer ALL parts of the question. Each part carries 2 Marks, Total Marks: 10

Question No	Question	Learning levels as per Bloom's taxonomy	CO Mapping
1(a)	"During heavy rainfall, some of the roads of smart city Bhubaneswar are getting submerged" Considering this statement, write a suitable title with capitalization. (Ans: Poor Drainage System of Smart City Bhubaneswar Any other suitable Title can be considered with capitalization)	II	CO 4
1(b)	What is your understanding about a conflict of interest statement? Write a conflict of interest statement **Ans:** **Conflict of interest:** • Research often results in personal gains for the researchers. • Such gains sometimes conflict with responsible research practices. • Three aspects of such conflicts are: 1. Financial gain 2. Work commitments 3. Intellectual and personal matters **Examples of conflicts of interest: (Can be any one type)** • The authors declare no competing financial interests. • There exists no potential conflict of interest • The first author serves as a consultant to ABC company and the second author had earlier worked at the XYZ hospital. We report no other conflict of interest relevant to this article. • A grant (No. XXX) has been awarded to the first author by S for conducting this study. No other author has any other financial link with S. • The MN university owns a patent (No. YYY) which uses the approach outlined in this article and which has been licensed to Z. • The authors have nothing to disclose.	II	CO 4
1(c)	Check the following sentences: (a) CO_2 emissions enhance the global warming. (b) The cement was replaced by fly ash at the rate of 10%, 20% and 30%. (c) During the last three days, the temperature increased by 2°C, 4°C and 6°C. (d) In the U.S., one can travel with only with U.S. dollar If a sentence is correct, write "No change required", else write the correct sentence. **Ans:** **The Correct sentences are:** (a) Carbon dioxide emissions enhance the global warming (b) The cement was replaced by fly ash at the rate of 10, 20 and 30%.	II	CO 5

	(c) During the last three days, the temperature increased by 2, 4 and 6°C. (d) In the US, one can travel with only with U.S. dollar		
1(d)	How can you validate the experimental results? **Ans:** Validation of results is done through: **Internal Validation** • Checks for inconsistency or contradiction in the data and the results. • The presence of inconsistency or contradiction indicates that the experiment had not been carried out in a scientific and well-planned manner. **External Validation** • Checks for matching of results with those obtained by others. • In case of a mismatch, credible explanation must be given. • If the researcher's test conditions are different from those of the other researchers, the results may not match, but they should be plausible and explainable	II	CO 6
1(e)	What is the difference between a summary and a conclusion? **Ans:** • Summary says what the problem is, how it is addressed in the paper, what results are obtained. • Conclusions state the essence of the final outcome of the study – the inferences drawn from the study	II	CO 6

SECTION B

Each question has two parts. Answer BOTH parts of Any THREE questions. Total Marks: 30

Question No.	Question	Marks	Learning levels as per Bloom's taxonomy	CO Mapping
2 (a)	Ayusha Agrawal has written a paper out of her research work. She investigated, by conducting laboratory experiments, the effect of speed, feed and depth of cut on the material removal rate and surface roughness of mild steel workpieces when they are turned with high-speed steel cutting tools. She had used response surface methodology to find the optimal values of the cutting parameters that maximized the material removal rate and minimized the surface roughness of the work pieces. She had used the multi-objective geometric programming method to separately obtain the optimal parameter values and compare them with those obtained with the response surface methods. She had concluded that a combined response surface design-cum-geometric programming approach is the key to get the optimal values of the machining parameters. (a) Write an abstract for the passage given above. (b) Suggest five keywords. **Ans:** **Writing abstract:** It should contain the following: • Research problem and importance • Methodology used	6	II	CO 4

	• Broad results and conclusions • Interpretation of results • Contributions **Examples of Keywords:** • Speed, Feed, and Depth of Cut; • Material Removal Rate in Turning Operations; • Combined Response Surface Design-cum-Geometric Programming Approach.			
2 (b)	Name the sections of a research article and briefly describe the contents of each. **Ans:** **Sections of a research article:** • Title • Authors' name and affiliations • Abstract • Keywords • List of symbols and abbreviations • Introduction • Literature survey • Methodology (Materials and methods) • Results and discussions • Conclusions • References (The students are supposed to describe briefly on above points)	4	II	CO 4
3 (a)	Following any standard reference style, write details of references for a book, a journal paper, a book chapter, conference proceedings and material on the Web. **Ans:** References: • For a Book Name(s) of the author(s), year of publication, title of the book, place of publication, name of publisher, edition number. • For a Paper Name(s) of the author(s), year of publication, title of the paper, title of the journal, volume, number, and page numbers. • For a Book Chapter Names of the authors, year of publication, title of the paper, title of the book, editor's/editors' name(s), place of publication, name of publisher, edition number, and page numbers. • For a Paper in a Conference Proceedings Names of the authors, year of publication, title of the paper, title of the conference proceedings, venue of the conference, dates of conference, editor's/editors' name(s), place of publication, name of publisher, edition number, and page numbers. • For a Material on the Web Name of the author or organization (if any), title of the material (if any), website address, and date accessed.	6	II	CO 5
3 (b)	Write down the rules associated with making figures and graphs **Ans:**	4	II	CO 5

	Graph guidelines • Label both X and Y axes and write their units of measure. • Do not crowd the interval marks on the axis scales. • Line weights should be the heaviest for the graph, and the lightest for the boundary (Maximize data-ink ratio). • All symbols and letters in the axis labels and the legend must be clear and readable (not less than 8 point). • To compare values of two variables, plot the two variables on the same graph using the same scale. • Give tick marks at equal intervals on each axis to indicate units of measurement. Tick marks should not too many, and should point outwards for both axes. • An axis label should be placed parallel to the axis unless the label is short (one or two words). Letters stacked vertically or words stacked vertically are bad. • To have better clarity, choose the Y-axis scale such that the curves are separated by adequate space. • Do not clutter a graph with too many curves. Usually, no more than four curves are shown in a graph **Figure guidelines** • The lines in a figure should never be thinner than 0.5 point and should be of uniform density. • Figures of equal importance should be of same size. • For computer-generated figures, the output must have a minimum resolution of 300 dots per inch (dpi). • The aspect ratio of a figure is height: width :: 2:3. • Use arrows, circles, call-out boxes, and similar aids to help you draw attention to details if needed. • In block diagrams, use a maximum of 10 blocks or shapes.			
4 (a)	In a research work, you have received support from others like materials, money, techniques, fellowship, discussions and revision of the manuscript. Write acknowledgments in the required sequence. **Ans:** **Acknowledgements** It should be written in the following sequence: • Intellectual contributions • Technical support • Provision of materials • Helpful discussions • Revisions and preparations of the manuscript • Funds, grants, fellowships, or financial contributions **Note:** All above points should be addressed individually **Example:** The authors express their gratitude to the Department of Science and Technology, Govt. of India for the financial support.	6	II	CO 6

<table>
<tr>
<td>4 (b)</td>
<td>You had conducted an experiment relating Temperature and Electric Current (the independent variables) to Force (the dependent variable). The experimental values of these variables as you had hurriedly written down in your laboratory notebook (without specifying the units of measure) are the following:
Temperature: 20, 50, 80.5.5, 110.05, 140
Pressure: 17.1, 15, 15.85, 16.085, 18.30
Force: 15, 46.2, 9.25, 0.125, 3.0
Put these values in a tabular form, with an appropriate caption and with the chosen SI units of measure for the variables.
Ans:

Table 1: Variation of Force with Temperature and Current
<table>
<tr><th>Sl. No.</th><th>Temperature (°C)</th><th>Current (A)</th><th>Force (N/m^2)</th></tr>
<tr><td>1.</td><td>20.00</td><td>17.100</td><td>15.000</td></tr>
<tr><td>2.</td><td>50.00</td><td>15.000</td><td>46.200</td></tr>
<tr><td>3.</td><td>80.50</td><td>15.850</td><td>9.250</td></tr>
<tr><td>4.</td><td>110.05</td><td>16.085</td><td>0.125</td></tr>
<tr><td>5.</td><td>140.00</td><td>18.300</td><td>3.000</td></tr>
</table>
In the title, the colon could be replaced by a period. It may not be centered.

Temperature could be measured in °C or °F, and Current in mA or in similar units.

The data could also be given with variables as row entities. But the precisions (i.e., the places of decimal) should not change.

There are a few errors in Q. 4b. The students should be given some benefit of doubt. Also enough care has to be taken to ensure error-free questions.</td>
<td>4</td>
<td>II</td>
<td>CO 6</td>
</tr>
<tr>
<td>5 (a)</td>
<td>Describe how experimental results are interpreted and generalized.
Ans:

Interpretation of Experimental Results

• Theoretical interpretations bring out the latent relationships among factors and progonosticate the likely effect of changes in factor settings on the figures of merit.

• Practical interpretations highlight the possible ways the results can be used in practice to develop new materials, products, or processes, find optimum factor settings, or achieve improvement in the performance in the existing process or product.

Generalization of Experimental Results

• Experiments are carried out in a specific experimental setting.
• The results should be general enough to be of interest to other researchers in the field.
• Setting of the objectives of the experiment, choosing</td>
<td>6</td>
<td>II</td>
<td>CO 5</td>
</tr>
</table>

	the variables and their settings, using a measurement system with high capability, and analyzing and interpreting the results properly hold the key to generalization. **Note:** Students are required to explain on above points			
5 (b)	What are the common rules followed for drawing a flow chart, explain each briefly. **Ans**: **Flow charts** Basic symbols of flow chart are: (1) *ellipse* – start or end of the flow of logic (2) *square* or *rectangle* – actions (3) *decision box* (rhombus) – alternative decisions (4) *arrow* – flow of logic (5) *circle* – continuity of flow from one place to another Note: Students are required to explain on above points	4	II	CO 5