

**NATIONAL INSTITUTE OF TECHNOLOGY DURGAPUR****Odd Semester Mid-Term Examination, 2023-24****Course Code:** CEE722**Course Name:** Construction Planning and Management**Question Paper No.:** NITDGP/CEE722/01**Full Marks:** 25**Time:** 90 Minutes**Date of Exam:** 12/09/2023

Instructions: Answer all the questions.

Materials to be supplied: Normal graph paper shall be supplied, if required.

Question No.	Body of the Question	Marks	Mapped CO																																																																								
1	Explain "Work Breakdown Structure (WBS)" with example.	5	CO4																																																																								
2	<p>A project consists of 8 activities <b>A, B, C, D, E, F, G</b> and <b>H</b> with their times of completion as follows:</p> <table><tr><th>Activities</th><th>Duration (months)</th></tr><tr><td><b>A</b></td><td>2</td></tr><tr><td><b>B</b></td><td>4</td></tr><tr><td><b>C</b></td><td>2</td></tr><tr><td><b>D</b></td><td>4</td></tr><tr><td><b>E</b></td><td>6</td></tr><tr><td><b>F</b></td><td>4</td></tr><tr><td><b>G</b></td><td>5</td></tr><tr><td><b>H</b></td><td>4</td></tr></table> <p>The precedence relationships are as follows:</p> <ul style="list-style-type: none"><li>• <b>A</b> and <b>B</b> can be performed in parallel.</li><li>• <b>C</b> and <b>D</b> cannot start until <b>A</b> is completed.</li><li>• <b>E</b> cannot start until half the work of activity <b>C</b> is completed.</li><li>• <b>F</b> can start only after activity <b>D</b> is completed.</li><li>• <b>G</b> starts once <b>C</b> is completed.</li><li>• <b>H</b> is the last activity, which should start after completion of <b>E</b>.</li></ul> <p>a) Determine the total time of completion of the project with the help of a <i>bar chart</i>.</p> <p>b) If there is an increase of 2 months in time of completion of activity A, what will be the total time of completion of project?</p>	Activities	Duration (months)	<b>A</b>	2	<b>B</b>	4	<b>C</b>	2	<b>D</b>	4	<b>E</b>	6	<b>F</b>	4	<b>G</b>	5	<b>H</b>	4	6	CO1																																																						
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3	<p>Details of all events for a project are given below. Draw the network diagram, and determine activity times. Also, determine all type of floats for each activity. Locate the critical path on the network. Indicate the minimum duration required to complete the project.</p> <table><tr><th>Event (s)</th><th>Predecessor Event (s)</th><th>Successor Event (s)</th><th>Duration (weeks)</th></tr><tr><td>1</td><td>-</td><td>2</td><td>36</td></tr><tr><td></td><td></td><td>3</td><td>4</td></tr><tr><td>2</td><td>1</td><td>8</td><td>2</td></tr><tr><td>3</td><td>1</td><td>4</td><td>2</td></tr><tr><td>4</td><td>3</td><td>5</td><td>15</td></tr><tr><td></td><td></td><td>7</td><td>9</td></tr><tr><td></td><td></td><td>8</td><td>10</td></tr><tr><td>5</td><td>4</td><td>6</td><td>4</td></tr><tr><td>6</td><td>5</td><td>7</td><td>9</td></tr><tr><td>7</td><td>4</td><td>8</td><td>9</td></tr><tr><td></td><td>6</td><td>9</td><td>8</td></tr><tr><td>8</td><td>2</td><td></td><td></td></tr><tr><td></td><td>4</td><td>9</td><td>20</td></tr><tr><td></td><td>7</td><td></td><td></td></tr><tr><td>9</td><td>7</td><td>10</td><td>20</td></tr><tr><td></td><td>8</td><td></td><td></td></tr><tr><td>10</td><td>9</td><td>-</td><td></td></tr></table>	Event (s)	Predecessor Event (s)	Successor Event (s)	Duration (weeks)	1	-	2	36			3	4	2	1	8	2	3	1	4	2	4	3	5	15			7	9			8	10	5	4	6	4	6	5	7	9	7	4	8	9		6	9	8	8	2				4	9	20		7			9	7	10	20		8			10	9	-		14	CO1
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**Course Outcomes**

CO1: Learn preliminaries of construction planning and management.

CO2: Learn construction safety aspects.

CO3: Learn contract management. Get exposed to tendering and contracting.

CO4: Learn about the running &amp; operation of government-run-engineering depart., elements of project financing, project selection &amp; use of construction equipment



**NATIONAL INSTITUTE OF TECHNOLOGY DURGAPUR****Odd Semester Mid-Term Examination, 2023-24****Course Code:** CEE721

Full Marks: 25

**Course Name:** Environmental Pollution & Control

Time: 90 Minutes

Instructions: Answer **any five** questions taking at least one from each of the mapped COs i.e. CO1 & CO2.

Question No.	Body of the Question	Marks	Mapped CO
1	(a) How is sound intensity, sound power & sound pressure related among themselves? (b) Define the following terms: Sound power level, sound intensity level & sound pressure level.	2+3 = 5	CO1
2	(a) If doubling an existing sound source results in an increase in the sound pressure level of 3dB, what will be the increase in the sound pressure level in dB if 10 such identical sound sources were present? Justify your answer. (b) A sound level meter tested with a pure tone source of 1000Hz emits 85dBA. What will be the reading in dBC & why?	2+2+1 = 5	CO2
3	(a) What are the different weighting networks and what is their importance in noise measurement? How are they introduced in sound level meters? (b) Describe the different patterns of noise.	2+1+2 = 5	CO1
4	(a) Compute the mean sound level from the following five readings (all in dBA): 40, 52, 66, 73 & 82. (b) An air conditioner generates a noise level of 72dBA for 6min. every hour. If the background noise level is 56dBA, compute the LAeq.	3+2 = 5	CO2
5	(a) A precision sound level meter can record the following values of SPL: L5, L10, L50, L90 and L95. State with reasons which of them will represent the following within the interval of noise measurement: (b) the peak noise level, & (ii) the background noise level. (c) Define Ldn & derive an expression for it, where the notation has its usual meaning.	2+3 = 5	CO1
6	(a) Show that if the distance from a point source is doubled, the resulting decrease in the sound pressure level is approximately 6 dB. (b) What do you understand by the term "sonic boom"? Explain with a neat sketch.	2+2+1 = 5	CO1

**Course Outcomes**

CO1: Apply knowledge of different types of environmental pollutants affecting the community life (air, solid wastes and noise) for design solutions.

CO2: Understand basic design philosophies applicable to control and safe disposal of different types of environmental pollutants.

CO3: Formulate, analyse, and design basic control and disposal systems of different types of environmental pollutants.



**NATIONAL INSTITUTE OF TECHNOLOGY DURGAPUR**  
**Odd Semester Mid-Term Examination, 2023-24**

Course Code: CEE730

Full Marks: 25

Course Name: Principles of Reliability

Time: 90 Minutes

Instructions: Answer all the questions.

Materials to be supplied: Standard normal distribution table is attached.

Question No.	Body of the Question	Marks	Mapped CO
1	Consider 'X' is random variable whether a randomly selected student performing a particular experiment in a test. From the previous records, it has been observed that 60% of the total students can perform this experiment. Now draw the PMF and CDF of X.	3	CO1
2	The air pollution in a city is caused mainly by the industrial and automobile exhausts. In the next 5 years, the changes of successfully controlling these two sources of pollution are, respectively, 70% and 62%. Assume that if only one of the two sources is successfully controlled, the probability of bringing the population below acceptable level would be 75%. (a) What is the probability of successfully controlling air pollution in the next 5 years? (b) If, in the next 5 years, the pollution level is not sufficiently controlled, what is the probability that it is entirely caused by the failure to control automobile exhaust?	5	CO1
3	The bearing capacity of the soil under a column-footing foundation is known to vary between 10 and 20 tone/sq. m. Its probability density within this range is given as $f_X(x) = \begin{cases} K(x-2); & 10 \leq x \leq 20 \\ 0, & \text{otherwise} \end{cases}$ If the column is designed to carry a load of 18.4 tone/sq. m, what is the probability of failure of the foundation?	5	CO1
4	A cantilever beam having span of 3.0 m is subjected to a lognormal distributed point load P at the free end. The mean and standard deviation of P are 35 kN and 3.5 kN, respectively. Determine the coefficient of variation of the maximum deflection using Monte carlo simulation technique. (Generate five sets of data)	6	CO2
5	A both ends fixed beam of span 3.8 m is subjected to a normally distributed udl w with mean 25.0 kN/m and standard deviation 5.0 kN/m. Calculate the mean and standard deviation of the maximum moment using Monte carlo simulation technique. (Generate five sets of value)	6	CO2

## Course Outcomes

CO1: Understand of reliability theory based on knowledge of fundamentals of probability and statistics

CO2: Apply Monte carlo simulation technique to solve different civil engineering problems.

CO3: Understand the different reliability analysis methods.

CO4: To design the elements of civil engineering structures by using reliability methods.

TABLE AI

[illegible]