Bharatiya Vidya Bhavan's

**SARDAR PATEL COLLEGE OF ENGINEERING**

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058

**End Semester Examinations June 2024**

11/6/24

**English for research paper writing**

Program: **M.Tech CME** Common to all

Course Code: **AE-MTSE 201-202**

Course Name: **English for Research paper writing**

Duration: **03 hours**

Maximum Points: **100**

Semester: **II**

- **Note:**
- Total seven questions are given
- Attempt any **five** questions
- Question 01 is compulsory
- Out of remaining questions attempt any 04
- Subsections of questions are to be attempted together.

| Q.No. | Questions | Points | CO | BL |
|---|---|---|---|---|
| 1.A. | Explain in detail why proficiency in English language is mandatory for researchers. How good English language does help in writing effective research thesis? | 10 | 01 | 03 |
| 1.B. | A student complained that she was having trouble with the following foreword, that it was more like an introduction than a foreword ( and she was right). Turn it into a foreword by eliminating details unnecessary for a managerial reader. Feel free to write the sentences and move information around.<br><br>***Foreword:***<br><br>Flutter is a phenomenon in which structural instabilities are often characterized by divergent oscillations of the wings, resulting in structural failure and possible loss of the aircraft. Flight flutter testing involves the tracking of damping estimates of the excited vibration modes at different flight conditions.<br><br>The violent nature of flutter makes safety an important concern during flight flutter testing. As with any flight test program, cost is also a major concern. Our objective at Smith is to provide safe testing at the lowest cost. Costs can be lowered by decreasing flight time. This requires utilizing the fastest analysis techniques that will meet the accuracy requirements that safety demands.<br><br>Presently we have two software packages available for data analysis | 10 | 01 | 01 |

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| | during flutter testing. They Are:<br><br>1. The Power Spectral Density Package (PSD)<br><br>2. The random Decrement (Randomdec) Package.<br><br>The main objective of each package is to determine damping estimates of the structural modes. I was assigned to do a comparison study of two packages looking at two questions<br><br>1. How accurate are the dumping estimates?<br><br>2. How much time is required for analysis?<br><br>These questions are concerned with safety and cost respectively. The purpose of this report is to present the findings of my study and to make some recommendations concerning future testing. | | | |
| 2. A. | "Barriers lead to miscommunication or misinterpretation of information or ideas". Explain in detail the barriers faced by researchers while reading technical papers. Describe the four levels of reading. | 10 | 02 | 02 |
| 2.B. | Explain the Strategies for effective reading techniques for journal papers. Draw a systematic diagram to reading technical papers. | 10 | 02 | 05 |
| 3.A. | Answer any 2 questions from the following (100 Words Each)<br>1. Discuss Email as a channel of communication<br>2. Explain the basic characteristics of a good report.<br>3. Explain the SQ3R technique to improve research paper reading<br>4. What are the two types of application letter? | 10 | 04 | 02 |
| 3. B. | Write a mail to Head of your department seeking permission to conduct a one week short term training program through the placement cell. Invent necessary details with schedule and details of speakers. | 10 | 03 | 04 |
| 4. A | Here is a first- hand account of a very good public speaker who trains professionals in public speaking.<br><br>I train business professionals in public speaking and also in preparing their project proposals and presentations. One day, my friend Mohan called and asked if I could help his boss, Mr. Andrew's who had to speak at the convocation ceremony of an engineering institute in Mumbai. I asked if his boss knew what he wanted to say, and Mohan said yes, but the talk was not developed yet and his boss wouldn't have time to devote to it until the weekend.<br><br>I learnt from Mohan that Mr. Andrews was really smart but not experienced in speaking to large groups.<br><br>We set up two meetings with Mr. Andrews- the first to discuss what the message would be; the second to practice it. I asked for a general | 15 | 04 | 03 |

summary of what would be said. Mohan replied, 'He is going to say something about today's job market for Engineering graduates due to the impact of pandemic and about its future as well. I was expecting to be briefed by Mohan on the content of his talk.

When I walked for the meeting, the receptionist escorted me into a meeting room off the lobby. Mohan too arrived, handed me his business card, and briefed me on the status of the scripts and slides (a work in progress). Shortly, Mr. Andrews arrived with a handful of wrinkled papers in his hand. They were his notes. He did not know how to connect his computer to the projector, or how to use power point well enough to re-sequencing the slides and add appropriate designs, insert tables and animate the slides where needed. However, his knowledge of contemporary job market was encyclopedic and the rate at which he spoke was supersonic. When I asked questions about his topic so that he could clarify what he wanted to say, and in what order, he was wonderfully patient with my modest understanding of his discipline, and used analogies and metaphors to explain his point-a sign, I think, of a good communicator.

In addition to speaking very fast he did not look me in the eye, and also did not relate what he said to the bar charts on the screen. But he spoke with visceral passion and emphatic verve about the way multinational companies are working these days – and that made up for his other flaws as a speaker. He could lift up his whole body and jump into a keyword with both feet-giving it real meaning and significance.

The challenge, however, was to develop his topic so that the audience would think they were hearing a standard talk about globalization and job markets for fresher's in particular and further developing to talk to strategies to get placed in good companies.

After two meetings, we cut the slides down to 40 and the timing down to 0ne hour. He had no time to rehearse. He promised he would work on it in his hotel room when he arrived in Mumbai. I continued to email him suggestions over the weekend.

I learned from Andrews that he did not rehearse until he was on the plane, and then he stayed up most of the night in a panic working on it. Two days after the event, he called to say it went well, and that me emails helped. I called Mohan to get his assessment, who said it was a little short- much shorter than the presentations made by other speakers.

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| | I pointed out that short presentations are not a bad thing-'For a speech to be immortal, it not be interminable'.<br><br>The points Andrews needed to remember were as follows:<br><br>1. Get attention of his audience<br>2. Sustain the attention<br>3. Make a clear point in a memorable way<br>4. Be unique in his own way<br>5. Persuade people to come to talk to him<br><br>His job was to generate trust and curiosity among his audience and sustain their interest in his convocation address.<br><br>**Questions:**<br><br>1. 'Mr. Andrews had not adequately planned and prepared his presentation'. Do you agree or disagree with this statement? Explain in detail the steps that Mr. Andrews needs to work on for planning the presentation.<br>2. What are the factors that Mr. Andrews need to keep in mind regarding the designing of his power point slides his body language, time and word budgeting during presentation. | | | |
| 4.B. | Prepare an Introduction to Mr. Andrews's presentation keeping the Delivering effective presentations syllabus topic in mind. | 05 | 04 | 03 |
| 5 A. | Apply for the position offered by "Shine International groups' ltd'.<br><br>Write a cover letter and detailed **Curriculum Vitae for the job position given below. ( Invent necessary details)**<br><br>Selected Engineer's Day-to-day Responsibilities Include<br><br>• Execution Planning of all the site civil related works - Earthwork / Civil work/ Footing Foundations, /JCB/ Dozers, etc ,<br><br>• Ensuring the quality of construction Materials<br><br>• Project work scheduling and maintaining the project Deadlines<br><br>• Project execution co-ordination with Consultants, Surveyors, Vendors, Management, etc.,<br><br>• Responsible for inventory storage of materials on the site. | 20 | 04 | 06 |

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| | • Preparing daily reports on closing stocks, labor attendance tasks done, etc.<br><br>• Administrative area: Budgets / indents / review, etc.<br><br>• Weekly submission of bill book, petty cash accounts with respect to the site works.<br><br>• To receive materials submit necessary documents for the same.<br><br>• Fix Agenda for review meetings, etc.<br><br>Desired Candidate Profile • M.Tech in Civil/ Electrical engineering •<br><br>0- 2 years of<br><br>Experience as a Civil/Site Engineer<br><br>• Intermediate knowledge required on AutoCAD, GIS and MS office<br><br>Role Structural/ Construction Management Industry<br><br>Type Engineering Construction Functional Area Site Engineering, Project Management Employment Type Full Time, Permanent Role Category Site Engineering Education PG : M.Tech /B.Tech. in Civil<br><br>**For Electrical Students:**<br><br>We seek a passionate, dynamic, and creative Electronics Engineer to join our team.<br>Responsibilities • Full product design • PCB design and layout • Electrical design including component selection, thermal system design, and interconnection hardware selection/design.<br>• Create assist with the documentation and implementation of Engineering Changes to the product design<br>• Work fluidly in a high cross-functional environment involving manufacturing, product development, as well as supply chain specialists, product design engineers, and logistics personnel. Behavioral Traits • Self-managed and willing to work in a fast-paced and time-variant environment<br>• Ambitious, self-starting and motivated attitude; willingness to learn Requirements<br>• **Bachelor/ Masters of Engineering/Technology in Electrical/Electronics/Mechatronics • Diploma in Engineering in Electrical/Electronics/Mechatronics**<br>• Previous internship project experience is a plus. (Self-projects most | | | |

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| | appreciated)<br>• Experience with software and hardware used in electronics product testing • Highly proficient in hands-on skills, especially soldering and component-level assembly, and troubleshooting equipment<br>• Fundamental knowledge of circuit design, battery-powered systems, refrigeration and air conditioning, electrical engineering materials, computer-aided electrical drawing, and manufacturing process<br>• Computer Basis (MS Office, Online Collaboration Tools)<br><br>careers@seebecutilities.com | | | |
| 6.A | The Government of India is concerned about the steady increase in the outbreak of diseases among working class especially youth. In order to work on the possible solutions, the Health Minister has asked you as the Chief Medical Officer of IMSI Delhi to find out the possible causes of these diseases, the problems faced and other related factors. On the basis of the data provided draft a **letter report** as Chief Medical Officer Delhi and submit your report with recommendations to the Health Minister of India.<br><br>1. Table showing diseases and the percentage of people suffering from it.<br><br>Please provide at least five recommendations to improve the situation | 20 | 02 | 04 |
| 7. A. | Read the given report carefully. The report given here is not written in proper format and language.<br><br>**Rewrite the complete report in (Memo Format) with complete details. Invent necessary details.**<br><br>(Make changes in style, sentence-construction, and sequencing and make it objective and remove vagueness wherever necessary).<br><br>Topic: The personnel officer of a factory reports on apprentice unrest.<br>Date: 13th June, 2024<br>To: The General Manager<br>From: the Personnel Officer<br>Subject: Apprentice unrest at K K Engineering Pvt. Ltd. | 20 | 03 | 04 |

| Sr No | Name of Diseases | Percentage of people suffering from it. |
|---|---|---|
| 1. | Diabetes | 25% |
| 2. | Blood Pressure | 20% |
| 3. | Stress | 25% |
| 4. | Asthma | 10% |
| 5. | Heart attacks | 10% |
| 6. | Slip Disc | 10% |

Terms of Reference: According to the instructions given by you, a report has been compiled on apprentice unrest and recommendations made.

Procedure

1. Interviewed twenty apprentices on the shop floor at random
2. Interviewed all supervisors and foremen concerned with apprentices.
3. Checked the data and records

Facts Findings:

1. Extent of Unrest: The results of the interviews with the supervisors and foremen were real eye–openers to say the least. I was shocked to hear that there is widespread resentment among the apprentices. They hinted that although everything seems calm on the surface, there is seething discontent and the situation may deteriorate unless we sit up and take note.

2. Cause of Unrest: The apprentices are disgruntled because of the following matters:

- 2.1. Training: They complained to me that:
  - 2.1.1. Supervisors are never there when they are needed
  - 2.1.2. We are used only on production lines
  - 2.1.3. We are never given a chance to learn something new.
- 2.2. Conditions: They cribbed about the fact that:
  - 2.2.1. Working conditions in the factory are not conducive
  - 2.2.2. The supervisors ignored the safety precautions.

3. Results of data and records
   - 3.1. salary unpaid
   - 3.2. Promotions and perks not given

Conclusion:

You must take immediate action to prevent disturbance and resolve grievances immediately. The records of all complaints were checked and found that there was no action on the complaints.

Recommendations:

1. Complaints regarding training should be resolved.
2. Working conditions should be improved
3. Rates of pay should be revised.

13th June, 2024

XYZ Personnel Office

Bharatiya Vidya Bhavan's

# Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058

**End semester Examination June 2024**

13/6/24

Program: M. Tech. Construction Management — Duration: 3 hr

Course code: PC-MTCM-201 — Maximum Points: 100

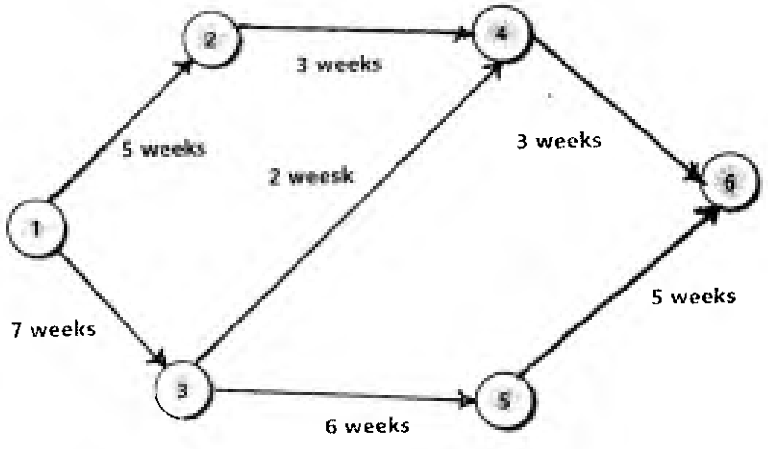
Name of the Course: Project Monitoring and Control — Semester: II

**Instructions:**

1. **Question no. 1 is compulsory**
2. Attempt any 4 questions out of remaining 6 question.
3. Neat diagrams must be drawn wherever necessary.
4. Figures to the right side indicate full points.
5. Assume Suitable data if necessary and state it clearly

| Q. No. | Questions | Points | CO | BL | Module |
|---|---|---|---|---|---|
| 1 | A contract is awarded to you for the construction of National Highway project.<br>(i) List the records to be maintained on the site for project monitoring and control<br>(ii) Discuss the quality control and safety plan for the National Highway project.<br>(iii) Discuss the hazard involved in the construction of National Highway project and mitigation measures.<br>(iv) Comment about how integrated approach helps in the construction of National Highway project. | 20 | CO1<br>CO2<br>CO3 | BL2<br>BL3<br>BL4 | 1,4,5,7 |
| 2(a) | Define lean construction and identify the waste observed in National Highway project. Discuss how it is useful for project monitoring control during construction of National Highway project execution? | 10 | CO1 | BL2 | 1,2,3 |
| 2(b) | Explain in detail the causes of time and cost overruns in National Highway construction project and discuss the corrective measures for the same with more emphasis on schedule delays. | 10 | CO1<br>CO2 | BL2 | 2,3 |
| 3 (a) | Discuss the utility of method statement during the construction of National Highway construction project monitoring and control. | 10 | CO3 | BL3 | 7 |
| 3 (b) | Discuss in detail cost of quality and cost of accident. | 10 | CO2 | BL3 | 4,6 |
| 4(a) | Discuss about construction project process group their integration points and corresponding documents required at that process stage. | 10 | CO3 | BL3 | 1,7 |
| 4(b) | A contract is awarded to you for the construction of National Highway project. It is proposed to update the project at the 40% completion stage. Discuss the need of updating the project along with the flowchart for updating of project | 10 | CO1 | BL3 | 1,7 |
| 5 (a) | Discuss the difference between an accident, an incident and a near-miss, and give examples of the same. | 10 | CO2 | BL2 | 5,6 |

| | | | | | |
|---|---|---|---|---|---|
| | Discuss common injuries observed in the construction of National Highway construction project along with causes and preventive measures. | | | | |
| 5 (b) | Prepare a checklist for the following construction project activities<br>i) RCC work<br>ii) Brick masonry<br>iii) Shuttering | 10 | CO3 | BL2 | 4 |
| 6 (a) | Discuss the factors which governs the productivity of equipment and labour. Discuss the corrective measures to improve the labour and equipment productivity. | 10 | CO2 | BL2 | 2 |
| 6 (b) | A project contains seven activities as shown below. | 10 | CO1 | BL4 | 1,3 |




The fund requirements for each activities are as mentioned below.

| Activities | Fund requirement in ₹ |
|---|---|
| 1-2 | 1,11,000.0 |
| 1-3 | 2,30,000.0 |
| 2-4 | 1,79,000.0 |
| 3-4 | 1,48,000.0 |
| 3-5 | 1,36,000.0 |
| 4-6 | 2,60,000.0 |
| 5-6 | 1,90,000.0 |

Prepare a schedule of funds requirement during the course of project implementation based on EFT and LFT

| | | | | | |
|---|---|---|---|---|---|
| 7 (a) | Define BIM. Discuss the benefits of BIM during life cycle of a construction project. | 7 | CO3 | BL3 | 7 |
| 7(b) | Differentiate between Quality Control and Quality assurance. | 4 | CO2 | BL2 | 4 |
| 7(c) | Discuss the need of scope management in the construction of National Highway project with emphasis on scope planning, detailing, scope monitoring & control along with scope verification. | 9 | CO3 | BL2 | 3,7 |

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Munshi Nagar, Andheri (W) Mumbai – 400058

M.Tech END SEMESTER EXAM- JUNE 2024

**Program: Civil Engineering with specialization of Construction Management**

**Duration: 3 hrs.** 20/6/24

**Course Code:** MTCMPEC- 201 **Maximum Points: 100**

**Course Name: Risk & Value Management** **Semester: II**

**Notes:**

1. **Q.1 is a compulsory and solve any four out of remaining six**
2. **Illustrate answer with neat sketches wherever required.**
3. **Make suitable assumptions where necessary and state them clearly.**

| Q.No. | Questions | Points | BL | CO | Module |
|---|---|---|---|---|---|
| 1 | **Solve any four:**<br>1. Make a list of risk analysis techniques.<br>2. Risk mitigation strategies.<br>3. Residual Risk<br>4. Risk Categories in construction project.<br>5. Make a list of risk identification techniques. | 20 | 1,2 | 1-3 | 1-3 |
| 2 | A. Define: Risk Identification. Explain in detail risk identification process. Also discuss the advantages disadvantages of risk identification.<br>B. Compare qualitative risk analysis Vs quantitative risk analysis.<br>C. Define: Risk Assessment Matrix. Discuss how risk assessment matrix helps the organization to combat risk analysis. | 10+05 +05 | 1 | 1 | 1,2 |
| 3 | A. What do you mean by decision tree analysis? Rahul's garage is considering hiring another mechanic. The mechanic would cost them an additional Rs.50,000 / year in salary and benefits. If there are a lot of accidents in Providence this year, they anticipate making an additional R.s.75,000 in net revenue. If there are not a lot of accidents, they could lose Rs. 20,000 off of last year's total net revenues. Because of all the ice on the roads, he thinks that there will be a 70% chance of "a lot of accidents" and a 30% chance of "fewer accidents". Assume if he doesn't expand he will have the same revenue as last year.<br>Draw a decision tree for Rahul and tell him what he should do.<br>B. For a project with the given data, calculate the real | 06+08 +06 | 2 | 1,2 | 2,3 |

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| | internal rate of return. Assume rate of inflation is 9.0 %.<br>**Year** / **Cash out flow** / **Cash inflow**<br>0 / 12,00,000/- / -<br>1 / / 5,50,000/-<br>2 / / 4,50,000/-<br>3 / / 4,00,000/-<br>4 / / 2,50,000/-<br>5 / / 1,80,000/-<br>6 / / 1,40,000/-<br>C. A product currently sells for Rs 13 per unit. The variable costs are Rs 5 per unit, and 12,000 units are sold annually and a profit of Rs.35,000 is realized per year. A new design will increase the variable costs by %22 and Fixed Costs by %10 but sales will increase to 14,000 units per year.<br>(a) At what selling price do we break even, and<br>(b) If the selling price is to be kept same (Rs 13/unit) what will the annual profit be? | | | | |
| 4 | A. Define: Risk Register. Make a list of components of risk register.<br>B. List the factors need to be considered by manager while taking decision on capital budgeting. Compute coef. Of variance, std. deviation and expected value.<br>**Cash flow** / **Probability**<br>35,000 / 0.2<br>55,000 / 0.3<br>1,10,000 / 0.3<br>1,20,000 / 0.2<br>C. What do you mean by risk response plan? Explain risk response strategies for positive risk, negative risk and both risks involved in organization. | 05+05 +10 | 2 | 1,2 | 3,4 |
| 5 | A. What is mean by Value Engineering? How can you differentiate Value Engineering with Cost Cutting/Reduction?<br>B. Write a detailed note on Transit Insurance.<br>C. What are the principles of Value Analysis? Write down its Merits and limitations. | 06+06 + 08 | 1,2 | 2,3 | 5-7 |
| 6 | A. What are the steps involved in Value Engineering? Draw a flowchart and explain each step in detail.<br>B. Construction insurance plays a vital role in Projects. Which are the different types of construction insurances exist? Explain any one. | 12+08 | 1,2 | 2,3 | 5-7 |
| 7 | A. Write a short note on Contractors plant and machinery (CPM) insurance w.r.t. following points<br>i. Features<br>ii. Who needs this policy<br>iii. What is the process for making a claim for Contractor | 15+05 | 1,2 | 2,3 | 5-7 |

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| | Plant and Machinery Insurance (CPM Insurance)?<br>iv. Benefits<br>v. What is included & Excluded from Contractor Plant & Machinery Insurance?<br>vi . Example or Case study<br><br>B. Write a short note on FAST Diagram. State the Purpose of FAST Diagram | | | | |

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**END-SEM Examinations, JUNE 2024**

24/6/24

Total points: 100

**Duration:** *Total Time allotted will be 3Hr.*

Class: M. TECH (CM) Semester: II Program: CIVIL

Name of the Course: **Modern Construction Materials** Course Code : **PE-MTCM214**

**Instructions:**

1. **Attempt any 5 Questions**
2. Assume suitable data if necessary and state the clearly.

| Que. No | | Points | CO | BL | Module no |
|---|---|---|---|---|---|
| 1 | A. Which are the criteria's for material selection in construction industry. Explain it along with all other properties like Variability, economical etc. | 5 | 1, 2 | 1 | 5 |
| | B. Describe three main classes of clays. | 5 | 2 | 2 | 1 |
| | C. Explain the metallic glasses as state of amorphous in detail? | 5 | 3 | 1 | 2 |
| | D. Define Diffusion coefficient and state the factors affecting it. | 5 | 2 | 1 | 3 |
| 2 | Write short note on followings (Any 4)<br>1. Closely-packed plane of sphere.<br>2. Structure ABABAB<br>3. Hexagonal close packed structure<br>4. Body centered cubic structure<br>5. Kaolinite structure | 20 | 1,2,3 | 2 | 1,2 |
| 3 | A. Write note on calcium silicate hydrate and its application in Civil Engineering. | 10 | 1,3 | 2 | 3 |
| | B. What are polymers and Compare the different types of polymers along with diagrams. | 10 | 2 | 1 | 7 |

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| 4 | A. Explain different types of dislocation movement? | 5 | 1 | 2 | 4 |
| | B. What is the process of bonds formed in Van der Waals? | 5 | 3 | 1 | 1 |
| | C. Write a note on Condon Morse diagram. | 5 | 2 | 2 | 2 |
| | D. Explain the structural composition of silica and silicates along with diagrams | 5 | 1 | 2 | 3 |
| 5 | A. Explain the concept of Ionic and Covalent, and Metallic bonding. | 10 | 1,3 | 1 | 1 |
| | B. With the help of neat sketch diagram, explain the term Bonding Energies. What are the consequences of temperature in this kind of bond energies? | 10 | 1,2 | 2 | 1 |
| 6 | A. Explain how slips occurs along different planes of lattice structure in a crystal? | 5 | 2 | 3 | 3 |
| | B. Write a note on Atomic diffusion. | 5 | 1 | 1 | 1 |
| | C. Compare different types of crystal defects in details | 5 | 3 | 2 | 4 |
| | D. What is the microstructure, explain its types. | 5 | 1 | 1 | 2 |
| 7 | A. What is precipitation of solids? | 5 | 1 | 2 | 3 |
| | B. Explain Phase diagram in detail along with Gibb's phase rule. | 5 | 2 | 3 | 4 |
| | C. How the listing of elements is done w.r.t. their atomic number? Explain how they are arranged into periods and groups. | 5 | 1,2 | 1 | 1 |
| | D. Write a note on crystallization from melts. | 5 | 2 | 2 | 7 |

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**End –SEM Examinations, JUNE 2024**

26/6/24

Total points:100 Contin. upl

**Duration:** *Total Time allotted will be 3Hr.*

Class: M. TECH(CM) Semester: II Program: Civil

Name of the Course-Operational Research **Course** Code : OE-MTCM201

**Instructions:**

1. Draw neat diagrams
2. Assume suitable data if necessary and state the clearly.

| | | Points | CO | BL | PI |
|---|---|---|---|---|---|
| Q1(A) | Solve Following LPP by using Kuhn-Tuckers conditions<br><br>Min Z = $X_1^2 - 2X_2^2 + X1 * X2$<br>Subject to,<br>4X1 + 2X2 <= 24<br>5X1 +10X2 <= 30 | 10 | 2,4 | 4 | 2.2.2 |
| Q1(B) | A ready-made garments manufacturer has to process five items through 2 stages of production, viz. cutting and sewing. The time taken for each of these items at the different stages is given below (in hours):<br><br>Item \| 1 \| 2 \| 3 \| 4 \| 5<br>cutting \| 5 \| 7 \| 3 \| 4 \| 6<br>sewing \| 2 \| 6 \| 7 \| 5 \| 9.<br><br>Find an order in which these items should be processed so as to minimise the total processing time. Also calculate the various idle times. | 10 | 3,4 | 3 | 4.2.1 |
| Q2 | Solve following LPP by revised simplex method<br>Max Z =2X1+X2<br>Subject to,<br>3X1+4X2 <= 6<br>6X1+X2 <= 3<br>X1, X2 >= 0 | 20 | 1,2 | 4 | 3.2.1 |

| | | | | | |
|---|---|---|---|---|---|
| Q3(A) | Explain all types of cost involved in Deterministic inventory model<br>If for a project, annual demand is 10000/year, order cost=300/order, carrying cost = Rs 4/unit/year then<br>1. Estimate Economic order quantity and Total cost of project<br>2. Draw graphs for all types of costs in EOQ concept. | 10 | 2,4 | 4 | 4.3.2 |
| Q3(B) | Derive formulae for total cost and EOQ for continuous demand instantaneous replenishment model. | 10 | 2,4 | 3 | 2.3.2 |
| Q4(A) | Customers arrive at the clinic at the rate of 8/hour (Poisson's Ratio), And doctor can serve at the rate of 9/hour (Exponential),<br>1. What is the probability that customer does not join the que and walks in doctor's room?<br>2. What is the probability that there is no que?<br>3. What is the probability that there are 10 customers in the que?<br>4. What is the expected number in the system?<br>5. What is the expected waiting time in the queue? | 10 | 3,4 | 4 | 2.3.2 |
| Q4(B) | People arrive at web browsing centre at the rate of 10/hour(Poissons arrival) . There are two computers used for browsing and expexted time taken by a person is 10 minutes.<br>Find-<br>1. The probabality that both the computers are free when person arrives<br>2. The probabilty that person can use computer immediately on arrival.<br>3. The probabailty that there is no que on arrival<br>4. The expected number in system<br>5. Waiting time in que<br>6. How many computers should be avalibale if expected waiting time in queue is to be less than 10 minutes. | 10 | 2,4 | 3 | 4.3.3 |
| Q5 | Minimise f(x) = $7 * X_1 * X_2^{-1} + 3 * X_2 * X_3^{-2} + 5 * X_1^{-3} * X_2 * X_3 + X_1 * X_2 * X_3$<br>Where, X1, X2, X3 >= 0<br>Solve above model using geometric programming | 20 | 1,3 | 5 | 3.2.1 |

| | | | | | |
|---|---|---|---|---|---|
| Q6 | A trader stocks a particular seasonal product at the beginning of the season and cannot re-order. The item costs him Rs. 25 each and he sells at Rs. 50 each. For any item that cannot be met on demand, the trader has estimated a goodwill cost of Rs. 15. Any item unsold will have a salvage value of Rs. 10. Holding cost during the period is estimated to be 10 per cent of the price. The probability distribution of demand is as follows:<br><br>Unit Stocked: 2 \| 3 \| 4 \| 5 \| 6<br>Probability of demand: 0.35 \| 0.25 \| 0.20 \| 0.15 \| 0.05<br><br>Determine the optimal number of items to be stocked using **Incremental analysis method.** | 10 | 3,1 | 5 | 3.2.2 |
| Q6(B) | A factory manufactures two products A and B. To manufacture one unit of A, 1.5 machine hours and 2.5 labour hours are required. To manufacture product B, 2.5 machine hours and 1.5 labour hours are required. In a month, 300 machine hours and 240 labour hours are available.<br>Profit per unit for A is Rs. 50 and for B is Rs. 40. Formulate as LPP. | 10 | 1,4 | 5 | 3.2.1 |
| Q7(A) | Activity \| Duration<br>1-2 \| 8<br>1-3 \| 10<br>1-4 \| 5<br>2-7 \| 6<br>3-4 \| 3<br>4-5 \| 7<br>4-7 \| 0<br>5-6 \| 4<br>5-7 \| 3<br>5-8 \| 6<br>6-8 \| 5<br>7-8 \| 5<br><br>Determines all types of floats and critical Path using information given in above table. | 10 | 1,3 | 4 | 1.2.3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Q7(B) | | | | | 10 | 1,3 | 4 | 1.2.3 |

| Activity | Duration(weeks) | | |
|---|---|---|---|
| | a | m | b |
| 1-2 | 1 | 1 | 7 |
| 1-3 | 1 | 4 | 7 |
| 1-4 | 2 | 2 | 8 |
| 2-5 | 1 | 1 | 1 |
| 3-5 | 2 | 5 | 14 |
| 4-6 | 2 | 5 | 8 |
| 5-6 | 3 | 6 | 15 |

I) Construct the project network

II) Find expected duration and variance of each activity

III) Find critical path and expected project duration time

IV) What is the probability of completing the project on or before 18 weeks?

V) What is the probability of completing the project 3 weeks earlier than expected time?

# SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)
Munshi Nagar, Andheri (W) Mumbai – 400058

**End Semester Exam- June 2024**

**Program: M.Tech Civil Engg**

**Course Code: OE-MTSE202/OE-MTCM202**

**Course Name: Legal aspects in construction**

**Duration:3hr**

**Maximum Points:100**

**Semester:II**

| Q.No. | Questions | Points | CO | BL | Module No. |
|---|---|---|---|---|---|
| 1 | Q.1 ) Write Short Notes (Any Four)<br>a) Principles of Natural Justice<br>b) Privity of Contract<br>c) Accord & Satisfaction<br>d) Advantages of collective bargaining<br>e) Settlement agreement<br>f) Lay-off,Lock-out & Strike | 20 | 1,3,4 | 02 | 1,3,4 |
| 2 | Define Voidable Contract.When Court declares the contract voidable? Discuss with Case Laws. | 20 | 2 | 02 | 2 |
| 3 | Unfair Labour Practices as per MRTU & PULP Act,1971.Discuss with Case Laws. | 20 | 4 | 03 | 3 |
| 4 | State the grounds for setting aside an Arbitral Award.Discuss with Case Laws. | 20 | 3 | 02 | 4 |
| 5 | Discuss with Case Laws the powers,duties & obligations of the Arbitral Tribunal. | 20 | 3 | 03 | 4 |
| 6 | What is breach of contract?<br><br>Discuss the principles under the Indian Contract Act,1872 in which Court award damages with Case Law. | 20 | 2 | 03 | 7 |
| 7 | Explain in details<br>• Salient features of Arbitration & Conciliation Act,1996<br>• Welfare measures for workmen under Building & Other Construction Act,1996 | 20 | 2 | 03 | 5,6 |

Bharatiya Vidya Bhavan's

# Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

**End Sem Examinations, JUNE 2024**

M.Tech Civil (CM) Construction Mgt. Sem II 18/6/24

Total points:100

**Duration:** *Total Time allotted will be 3Hr.*

Class: M.TECH(CM). Semester: II Program: Civil

Name of the Course: **Project Appraisal, Planning and Scheduling** Course Code : PC-MTCM202

**Instructions:**

1. **Questions no 1 & 2 are compulsory**
2. Draw neat diagrams
3. Assume suitable data if necessary and state the clearly.

<table>
<tr><th>Question No</th><th></th><th>Points</th><th>CO</th><th>BL</th><th>PI</th></tr>
<tr><td>Q1(A)</td><td>
<table>
<tr><th>Activity</th><th>$t_o$ (in days)</th><th>$t_m$</th><th>$t_p$</th></tr>
<tr><td>1-2</td><td>2</td><td>5</td><td>8</td></tr>
<tr><td>1-3</td><td>1</td><td>4</td><td>7</td></tr>
<tr><td>2-3</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>2-4</td><td>2</td><td>4</td><td>4</td></tr>
<tr><td>2-6</td><td>5</td><td>7</td><td>7</td></tr>
<tr><td>3-4</td><td>3</td><td>5</td><td>5</td></tr>
<tr><td>3-5</td><td>3</td><td>6</td><td>6</td></tr>
<tr><td>4-5</td><td>4</td><td>6</td><td>6</td></tr>
<tr><td>4-6</td><td>2</td><td>5</td><td>5</td></tr>
<tr><td>5-6</td><td>2</td><td>4</td><td>4</td></tr>
</table>
1. Draw the project network.<br>2. Find the critical path.<br>3.Find the probability that the project is completed within 23 days.<br>4. Find the probability P(Z<= 1.2) AND P(Z>= 1.5)</td><td>10</td><td>2,3</td><td>4</td><td>2.2.3</td></tr>
<tr><td>Q1(B)</td><td>
<table>
<tr><th>Activity</th><th>Duration</th></tr>
<tr><td>1-2</td><td>8</td></tr>
<tr><td>1-3</td><td>10</td></tr>
<tr><td>1-4</td><td>5</td></tr>
<tr><td>2-7</td><td>6</td></tr>
<tr><td>3-4</td><td>3</td></tr>
<tr><td>4-5</td><td>7</td></tr>
<tr><td>4-7</td><td>0</td></tr>
</table>
</td><td>10</td><td>1</td><td>2</td><td>1.2.2</td></tr>
</table>

| | | | | | |
|---|---|---|---|---|---|
| | 5-6 \| 4<br>5-7 \| 3<br>5-8 \| 6<br>6-8 \| 5<br>7-8 \| 5<br><br>Draw network and estimate all times and floats with critical path and duration. | | | | |
| Q2 | | 20 | 2,3 | 4 | 3.2.1 |

| Activity | Time(in weeks) | | Cost(in Rs) | |
|---|---|---|---|---|
| | Normal | Crash | Normal | Crash |
| 1-2 | 8 | 4 | 3000 | 6000 |
| 1-3 | 5 | 3 | 4000 | 8000 |
| 2-4 | 9 | 6 | 4000 | 5500 |
| 3-5 | 7 | 5 | 2000 | 3200 |
| 2-5 | 5 | 1 | 8000 | 12000 |
| 4-6 | 3 | 2.5 | 10000 | 11200 |
| 5-6 | 6 | 2 | 4000 | 6800 |
| 6-7 | 10 | 7 | 6000 | 8700 |
| 5-7 | 9 | 5 | 4200 | 9000 |

Indirect cost 2000 per week.

The activities involved in the construction of a certain project are given in Table. Crash the CPM model to find out optimum cost and time.

| | | | | | |
|---|---|---|---|---|---|
| Q3(A) | Calculate Net Present Value of both projects for two investment rates 14% and 20%, Cost of Capital 10% | 5 | 2 | 4 | 3.2.1 |

| | Project X | Project Y |
|---|---|---|
| Year | Cash Flow | Cash Flow |
| investment | 110000 | 110000 |
| 1 | 31000 | 71000 |
| 2 | 40000 | 40000 |
| 3 | 50000 | 40000 |
| 4 | 70000 | 20000 |

| | | | | | |
|---|---|---|---|---|---|
| Q3(B) | Calculate Net benefit-cost ratio of a project with following details<br>Initial Investment= Rs 1000000, cost of capital=12% | 5 | 2 | 4 | 3.2.1 |

| | | | | | |
|---|---|---|---|---|---|
| Q3(C) | Benefits / Investment<br>Year 1: 25000<br>Year 2: 40000<br>Year 3: 40000<br>Year 4: 50000<br><br>Calculate Internal Rate of Return (IRR) with discount rate = 15%<br>Year / Cash Flow<br>0: 3000<br>1: 9000<br>2: 3000 | 5 | 2 | 4 | 3.2.1 |
| Q3(D) | Explain Line of Balance Method with example | 5 | 1,2 | 2 | 1.2.2 |
| Q4(A) | Explain augmented reality and virtual reality with examples in construction industry. | 10 | 2,3 | 4 | 3.2.1 |
| Q4(B) | How would you practice SWOT analysis to recognize and select a project | 10 | 1,2 | 3 | 1.2.2 |
| Q5(A) | Deliberate the process of generating and screening the project ideas. Also explain what factors affect the project ideas along their consequences. | 10 | 1,2 | 2 | 2.2.1 |
| Q5(B) | Explain Different analysis carried out for Project Appraisal? | 10 | 1,2 | 1 | 2.2.1 |
| Q6(A) | Enumerate the stages of planning by different agencies? | 10 | 1,2 | 2 | 1.2.2 |
| Q6(B) | What is Work breakdown structure? Develop WBS for water treatment plant | 10 | 1,2 | 2 | 1.2.2 |
| Q7(A) | Why provisions for inflation and contingencies are important. | 10 | 2,3 | 2 | 1.2.1 |
| Q7(B) | Describe different types of budgets | 10 | 2,3 | 3 | 2.1.1 |