BITT POLYTECHNIC
Getlatu, Ranchi- 835217

BITT-P/NOTICE/2025 – 26/ 11143
Date: 29-12-2025

NOTICE

Subject: Regarding Assignment Submission

This is to inform all students of 1st, 3rd, and 5th Semester (Session 2025–28, 2024–27, and 2023–26 respectively) that the assignment must be submitted in the prescribed format to their respective departments.

Last Date of Assignment Submission: 05.01.2026

Note:
Non-submission of the assignment may result in degradation of internal marks.The prescribed format and assignment questions are attached with this notice.

All students are strictly instructed to adhere to the given format and ensure timely submission. Delayed submissions will not be entertained under any circumstances.

for
Principal
BITT Polytechnic
Getlatu, Ranchi

Principal
BITT Polytechnic

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BIRSA INSTITUTE OF TECHNOLOGY

BITT POLYTECHNIC, GETLATU, RANCHI – 83521

ASSIGNMENT SUBMISSION

Program**: Diploma in [Your Branch Name]**

Semester**: [e.g., 1st/3rd]**

Session**: [e.g., 2023–2026]**

***Submitted by**:*

Name**: [Your Full Name]**

Registration Number**: [Your JUT Registration Number]**

Roll Number**: [Your Roll Number]**

Mobile Number**: [Your Mobile Number]**

Email ID**: [Your Email ID]**

ASSIGNMENT QUESTION

SEMESTER: 1ST

SUBJECT: ENGINEERING MATHEMATICS
SUBJECT CODE: BSC101

1. Solve the system of equations using Cramer's Rule:
   $2x + y - z = 1$
   $x + 3y + 2z = 11$
   $3x - y + z = 5$

2. Find the equation of the line parallel to $3x - 4y + 7 = 0$ and passing through $(2, -1)$

3. Find the angle between the lines $2x - y + 3 = 0$ and $x + 2y - 5 = 0$.
4. If $\sin\theta = 3/5$ and θ lies in second quadrant, find $\cos\theta$ and $\tan\theta$.
5. Differentiate $y = x^3 \sin x + e^x$.
6. Find the second derivative of $y = x^4 - 3x^2 + 5$.

SUBJECT: ENGINEERING CHEMISTRY
SUBJECT CODE: - BSC103

1. Explain isotopes and isobars with suitable examples and distinguish between them.
2. Explain Bohr's atomic theory with postulates and limitations.
3. Distinguish between orbits and orbitals**.**
4. Explain Aufbau's principle, Hund's rule and write the electronic configuration up to atomic number 30**.**
5. Describe the formation of electrovalent and covalent compounds with examples such as:
   NaCl, $CaCl_2$, MgO, $AlCl_3$, CO_2, H_2O, Cl_2, NH_3, C_2H_4, N_2 and C_2H_2.

SUBJECT: ENGINEERING PHYSICS
SUBJECT CODE: - BSC102

1. Explain the need of measurement and units in engineering and science.
2. Find the least count of Vernier Caliper, Micrometer Screw Gauge and Sphereometer.
3. Explain stress–strain diagram**,** yield point**,** ultimate stress**,** breaking stress and factor of safety**.**
4. Explain Laplace's molecular theory of surface tension**.**
5. State the relation between surface tension, capillary rise and radius of capillary.

SUBJECT: BASIC SURVEYING
SUBJECT CODE: - CIV101

1. Explain the principles of surveying and units of linear and angular measurements**.**
2. Explain the responsibilities of a surveyor**.**
3. Discuss the future scope, career progression and opportunities after completing the course.
4. Explain the method of chaining on flat ground and chaining on sloping ground by stepping method**.**

SUBJECT: FUNDAMENTAL OF COMPUTER
SUBJECT CODE: - CSE101

1. Explain the number systems**:** Binary, Octal, Decimal and Hexadecimal with their characteristics.
2. Explain complements of number systems and perform binary arithmetic operations**.**
3. Explain computer codes: BCD, EBCDIC, ASCII, Gray code, Excess-3 code and Unicode with examples.
4. Explain the working of basic and universal logic gates **with** symbols, truth tables and logic circuits**.**

SUBJECT: BASICS OF ELECTRICAL POWER SYSTEM
SUBJECT CODE: - EEE101

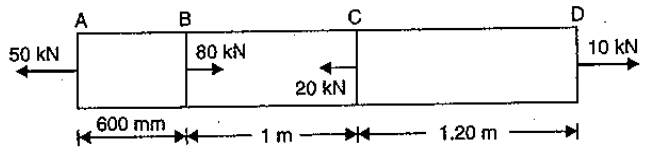
1. Explain the power sector scenario of India with respect to generation, transmission and distribution
2. Explain the sources of energy available in nature and classify them into conventional and non-conventional sources with examples.
3. Explain the factors to be considered for selection of site for a hydro power plant.
4. Explain the selection of site**,** general layout **and** working of a thermal (steam) power plant with neat diagram.

SUBJECT: MECHANICAL SCIENCE& ENGINEERING
SUBJECT CODE: - MEC101

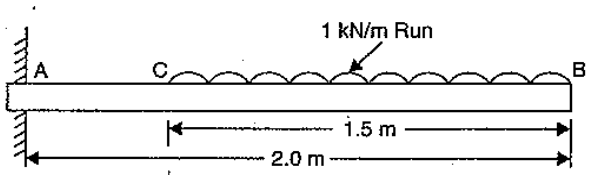
1. Explain the classification of engineering materials with suitable examples.
2. Explain the physical properties and mechanical properties of metals**.**
3. Explain cast iron and classify the types of cast iron**.**
4. Explain alloy cast iron and the effect of impurities on cast iron**.**

SEMESTER: 3RD
Branch: Civil Engineering
Subject: Engineering Mechanics and Strength of Materials
Subject Code: CIV301

1. Write any six mechanical properties of metal.
2. Define Hooke's Law. Write the types of stresses and strain.
3. What is Poisson's Ratio? Derive Modulus of Elasticity.
4. A brass bar, having cross sectional area of 1000 mm^2, is subjected to axial forces shown in fig. Find Total Elongation of bar. Take E = 1.05×10^5 N/mm^2



5. A cantilever of length 2.0 m carries a uniformly distributed load of 1kN/m run over length of 1.5 m from the free end. Draw the shear force and bending moment diagram for the cantilever.



Branch: Civil Engineering
Subject: Modern Surveying
Subject Code: CIV302

1. What is a contour? Write Importance of contour maps and its Characteristics.
2. What is the method of plotting contour? Write Factors affecting contour interval.
3. Write component parts of transit theodolite and their functions.
4. List the Applications of different types of theodolites.
5. Write about Theodolite traversing. What is open and closed Traverse?

Branch: Civil Engineering
Subject: Construction Techniques
Subject Code: CIV303

1. Write classification of soils and their suitability for the construction of different structures.
2. Write Method of improving the safe bearing capacity.
3. What is Foundation? Write Purpose and classification of foundation.
4. Write the types of masonry work and their suitability.
5. List the tools and equipments used for site clearance and excavation work.

Branch: Civil Engineering
Subject: Building Drawing using CAD
Subject Code: CIV304

1. What is Building bye Laws? What is the objective of Building bye Laws?
2. Write the function of Local Authority. What is the responsibility of owner?
3. Write applicability and Principles underlying building bye laws.
4. Explain the safety precaution to be followed at site during building construction as per National Building Code.
5. Write about building planning and site selection.

Branch: Computer Science Engineering/CSIS
Subject: Python Programming
Subject Code: CSE301

1. What is Python and defines all the features of python with suitable example?
2. What is token and how many types of token define with suitable example
3. Write a program to enter any two numbers and exchange its value by each other 1f 1^{st} value is greater than 2^{nd} values otherwise double of them
4. WAP to enter any three number and find largest among them
5. WAP to enter any 4 number fined their sum and average and fine average is even number or odd number

Branch: Computer Science Engineering/ CSIS
Subject: Computer Hardware, Maintenance and Administration
Subject Code: CSE302

1. What are different types of Input-Output (I/O) devices?
2. Explain Motherboard and functional description with diagram.
3. What are difference between RAM and ROM? Write different types of RAM and ROM.
4. What do you mean by E-Waste Management?
5. Explain major causes and prevention of E-Waste.

Branch: Computer Science Engineering/CSIS
Subject: Computer Networks
Subject Code: CSE303

1. Explain the OSI Model and its layers.
2. Explain the different categories of Networks.
3. What is network topology? Define the Bus, Ring, Star, Mesh and Hybrid topology.
4. What is Transmission Impairment?
5. Write short notes :

Attenuation, Bandwidth, Lattency, Jitter, Throughput

Branch: Computer Science Engineering/CSIS
Subject: Database System Concepts and PL/SQL
Subject Code: CSE304

1. What is file? What are the disadvantages of File processing and also write difference between files and DBMS.
2. What are the components of DBMS?
3. Define Entity, attribute, Data, Database.
4. Define DBMS Architecture and its types.
5. Explain Data model and its types

Branch: Electrical Engineering
Subject: Basics of Electrical power System
Subject Code: EEE301

1. Write construction and working of hydraulic Power Plant.
2. Write classification of hydroelectric power plants based on the available head of water.
3. Write working of thermal power plant. Advantages and disadvantages of Thermal power plant.
4. What are the Environmental Impact of Thermal power plants?
5. Write Construction and working of Nuclear power plant.

Branch: Electrical Engineering
Subject: Transmission and Distribution
Subject Code: EEE302

1. Represent vectors in Rectangular, Trigonometric and Polar forms.
2. Explain active power, reactive power, apparent power and power factor in AC circuit.
3. Explain KCL and KVL.
4. Explain Thevenin's and Superposition theorem and application of theorems.
5. Write various systems for power transmission and distribution.

Branch: Electrical Engineering
Subject: Switchgear and Protection
Subject Code: EEE303

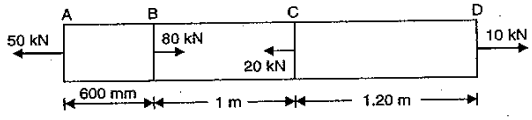
1. What is the meaning of Switch gear? Write types and essential features of Switchgear.
2. List most commonly used Switchgear equipment and Protective Devices for switching and interruption of current.
3. Write importance of power system protection and Necessity of Protective Device.
4. Write sources of Faults and Types of faults.
5. Write harmful Effects of short circuit current.

Branch: Electrical Engineering
Subject: Analog and Digital Electronics
Subject Code: EEE304

1. What is the classification of passive components?
2. Write the types and application of passive components.
3. What is Semiconductors? Write the types and characteristics of Semiconductors.
4. Explain two types of Extrinsic Semiconductors.
5. Explain two types of Intrinsic Semiconductors.

Branch: Mechanical Engineering
Subject: Mechanics of Materials
Subject Code: MEC301

1. Write any six mechanical properties of metal.
2. Define Hooke's Law. Write the types of stresses and strain.
3. What is Poisson's Ratio? Derive Modulus of Elasticity.
4. A brass bar, having cross sectional area of 1000 mm^2, is subjected to axial forces shown in fig. Find Total Elongation of bar. Take E = 1.05×10^5 N/mm^2



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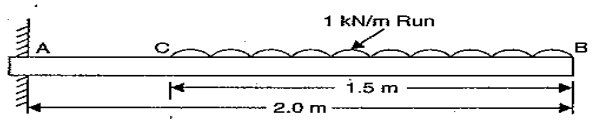

Branch: Mechanical Engineering
Subject: Machine Tool Technology
Subject Code: MEC302

1. Write the Preventive measures to be taken during Fire and Electrical emergency.
2. Write the Theory of metal Removal- Traditional & Non Traditional machining.
3. Distiguish between the Single cutting tools and Multi cutting tools.
4. Write the Lubricants used in the section and brief about its uses
5. What is grinding. Its application and its used.

Branch: Mechanical Engineering
Subject: Manufacturing Processes
Subject Code: MEC303

1. What do you mean by foundries and explain the safety Precautions to be taken in foundries.
2. What is Pattern the need of a Pattern- Types of Patterns—Solid or Single.
3. Write the Prepare a single Piece wooden Pattern considering all allowances.
4. Explain Hot and Cold Working Process
5. Determination of Production Cost of a given material considering Raw material, Process cost, Overheads and other expenses.

Branch: Mechanical Engineering
Subject: Fluid Power Engineering
Subject Code: MEC304

1. Calculate the density, specific weight and weight of one liter of petrol of specific gravity 0.7
2. Explain about the types of the fluids.
3. The capillary rise in glass tube is not to exceed 0.2mm of water. Determine its minimum size given that surface tension for water in contact with air is 0.0725N/m.
4. What is Bernoilli's equations and Derive Bernoulli's equation of motion?
5. Calculate the specific weight, density, specific gravity of one liter of liquid which weighs 7N.

SEMESTER: 5TH

BRANCH: MECHANICAL ENGINEERING
SUBJECT: PRODUCT DESIGN AND DEVELOPMENT

1. Explain the product development process with neat flow chart.
2. Describe concept development and concept selection methods in detail.
3. Explain product architecture with modular and integral types with examples.
4. Discuss ergonomics and aesthetic principles in product design.
5. Explain Design for Manufacturability (DFM) and its impact on cost, quality, and time.

SUBJECT: ENTREPRENEURSHIP DEVELOPMENT AND STARTUPS

1. Explain the role of entrepreneurship in economic development and job creation.
2. Describe the Design thinking process and explain empathy mapping for understanding customer needs with an example.
3. Explain SCAMPER technique, brainstorming, and reverse brainstorming. Also explain the concept of Minimum Viable Product (MVP) and idea validation techniques.
4. Describe its nine building blocks and explain how BMC helps in developing a startup business model.
5. Discuss the market, financial, legal, and operational foundations of a startup.

SUBJECT: Advanced Manufacturing Technologies

1. Explain the principle, construction and working of Ultrasonic Machining (USM). Also mention its applications, advantages and limitations.
2. Explain the principle, construction and working of Electro-Chemical Machining (ECM). Also discuss material removal mechanism and industrial applications.
3. Explain the principle, construction and working of Electrical Discharge Machining (EDM). Also explain dielectric fluid, tool material and factors affecting MRR.
4. Explain the principle, construction and working of Electron Beam Machining (EBM). Also mention vacuum requirement, advantages and limitations.

5. Explain the principle, construction and working of Laser Beam Machining (LBM). Also explain types of lasers used, applications and advantages.

SUBJECT: INTERNET OF THINGS (IOT)

1. Explain the characteristics of IoT and describe the physical design of IoT, including things in IoT and IoT protocols. Also explain the logical design of IoT, IoT functional blocks, and IoT communication models and APIs.
2. Explain the need for IoT systems management.
3. Explain popular IoT platforms and domain-specific IoT applications such as smart home, healthcare, agriculture, and industrial IoT.
4. Explain the role of Software Defined Networking (SDN) and Network Function Virtualization (NFV) in IoT systems.
5. Explain IoT components and system management.

BRANCH: ELECTRICAL ENGINEERING
SUBJECT: INDUSTRIAL AUTOMATION

1. Why is automation required in industries? Explain the motivation for industrial automation with suitable examples.
2. Describe the levels of industrial automation and types of automation.
3. Explain open-loop and closed-loop control systems with neat diagrams.
4. Explain the components used in a process control system.
5. Explain industrial automation applications with suitable examples.

SUBJECT: RENEWABLE ENERGY TECHNOLOGY

1. Explain solar radiation and solar radiation geometry in detail.
2. Explain the working principle of a solar cell with equivalent circuit and I–V characteristics.
3. Explain basic wind power terminologies including cut-in, cut-out, power coefficient and Betz limit.
4. Describe wind power generators such as PMDC generator, synchronous generator, SCIG and DFIG.
5. Explain wind turbine types, site selection criteria, and gearbox arrangement.

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BRANCH: CIVIL ENGINEERING
SUBJECT: WATER RESOURCE ENGINEERING

1. Classify irrigation projects and discuss the advantages and ill effects of excess irrigation.
2. Explain Symon's rain gauge and automatic rain gauge (tipping bucket type) with neat sketches.
3. Explain methods of irrigation: surface, subsurface and overhead irrigation.
4. Explain silting of reservoirs, rate of silting, factors affecting silting and control measures.
5. Describe control levels in a reservoir (MWL, FRL, MDDL, DSL).

SUBJECT: WATER RESOURCE ENGINEERING

1. Explain the importance of Transportation Engineering.
2. Explain the formation of the Jayakar Committee, its recommendations, and their implementation in India.
3. Explain the importance of Indian Road Congress (IRC), its committees and sub-committees, and the importance of IRC codal provisions in highway engineering.
4. Explain the characteristics of road transportation.
5. Discuss the National Highway Development Programme (NHDP) and explain the objectives and steps involved in highway realignment.

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BRANCH: COMPUTER SCIENCE ENGINEERING

SUBJECT: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

1. Explain how AI works, the purpose and goals of AI, and discuss the types of Artificial Intelligence.
2. Explain the applications of AI in different fields and discuss the significance of data in AI.
3. Explain the evolution of AI and Human–Machine Interface (HMI).
4. Explain the influence of AI in companies such as Amazon, Microsoft, Google and IBM, with reference to, Amazon Go, Google Deep Mind, and IBM Watson.
5. Explain the AI Software Development Life Cycle (AI-SDLC).

SUBJECT: HUMAN VALUES

1. Explain the concept of Right Understanding, Relationship and Physical Facility in the context of holistic human development.

2. Discuss continuous happiness and prosperity as the basic human aspirations and explain the method to fulfil these aspirations.

3. Explain the concept of human being as the co-existence of the Self and the Body.
4. Explain the body as an instrument of the Self and discuss harmony of the Self with the Body.
5. Explain harmony in the family as the basic unit of human interaction.

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5. Explain IoT components and system management.

BRANCH: ELECTRONICS & COMMUNICATION ENGINEERING

1. Explain the radio spectrum bands used for mobile and wireless communication.
2. Describe different wireless network generations and compare AMPS, N-AMPS, IS-95, GSM and UMTS in detail.
3. Discuss the limitations of 3G systems and explain the need for 4G (LTE)
4. Describe the LTE Network Architecture (eNodeB, MME, SGW, PGW, HSS, PDN)
5. Define cellular communication. Explain the following cellular fundamentals with neat diagrams. Cell and Cell Structure, Cluster, Frequency Reuse Factor.

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SUBJECT: ENTREPRENEURSHIP DEVELOPMENT AND STARTUPS

6. Explain the role of entrepreneurship in economic development and job creation.
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