R20

I B.TECH I SEM

SUPPLEMENTARY EXAMINATIONS

JULY 2023

Subject Code: R20CC1101

I B.Tech - I Semester Supple Examinations, July-2023
Technical and Communicative English-I

Time: 3 Hours   Max.Marks:**70**.   Branch: Common to all Branches.

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 14 =70M)

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1. A) I) **What were the simple delights that the children revelled in the 1990s?[8+6]**

   II) **Put appropriate punctuation marks in the following sentences.**

   1. dear sir said rama do not be angry this time and i will not do such a thing again
   2. thank you very much mother for taking us to the cinema said the children
   3. i wish i had a lot of property said the wife if one could be wished for i think i should wish for knowledge not for the property said the husband

   OR

   B) I) **Skim and scan** the text below and answer the following questions:[6+8]

   I really don't know why this book is so popular. I mean, I suppose it is going to appeal to young girls who want danger and romance, but I found this book really tedious. For a start, the characters were really unconvincing. The author went out of her way to add lots of details about the characters, but I found these details really pointless. I thought that some of the facts she presented about the main characters would become significant in some way later in the novel, but they didn't. They were just worthless bits of information. I also was disappointed that, although this book is meant to be about kids at high school, the writer seems to have no recollection at all about what it's like to be 17. The main character thought and acted like a 32-year old. It just wasn't believable. I'm not saying Teresa Wilson is a bad writer. She can obviously string words together and come up with a story that is appealing to a large number of people, but she lacks anything original. There is no flair. It just uses the same sort of language as you can see in many other mediocre novels.

   Q1: How did Kerry feel about the book?
   Q2: Which age group will like this book?
   Q3: Who is Teresa Wilson?
   Q4: Whose stories appeal large number of people?
   Q5: What does "mediocre" mean in the last line?
   Q6: Wrtie the antonym of *original*?

   II) **Identify the non-essential adjuncts in the following clauses.**

   1. In this case, it is quite clear that the testator's estate as a whole is solvent.
   2. To conclude, settled land in Roman law was to a considerable degree free from the depredations of creditors.
   3. At 2.00 a.m. eleven houses in Railton Road were raided by 176 police officers, with a further 391 held in reserve.
   4. Disorder was again evident in 1982 and in subsequent years, although on a reduced scale (Benyon and Solomos, 1987).

5. At the same time, the novel finds more to object to in the less objectionable aspects of these activities than many readers might anticipate.
6. An illustration of the complex relationship, envisaged by Marx and Engels, between ideas and the process of production is offered by the representation of labour.
7. They feed on large tough fruits and other vegetable matter, including bark which they can tear apart with their strong hands.
8. It limits people's ability to pursue some conceptions of the good, but only in order to equalize the opportunity to do so overall.

2.   **A) I) Why did Jawaharlal Nehru choose to write this letter to Indira instead of sending her some gifts on her 13th birthday? [8+6]**

   II) Fill in the blanks with suitable articles

   1. Miss Lin speaks _____Chinese.
   2. I borrowed _____ pencil from your pile of pencils and pens.
   3. My daughter is learning to play _____ violin at her school.

                                    OR

   B) I) *Correct the following sentences* if necessary[4+10]

   1. Cattles were grazing in the field.
   2. Neither of the singers were present
   3. I have brought all my furnitures.
   4. Each boy and each girl are going there.
   II) Fill in the blanks with suitable *prepositions.*

   1. This shop doesn't have the toys I was looking __. (up/for)
   2. The teacher divided the sweets ___ all the children. (between/among)
   3. Bruce did not fare well __ his examination. (in/at)
   4. The dog is grateful __ its owner. (to/for)
   5. My brother's anniversary is __ 5th November. (on/in)

3. A) I) What did Stephen Hawking discover in simple words?[8+6]
       II) Prepare your resume applying for a DATA ANALYST position in IBM
                                    OR
       B) I) You are Vijay and you are pursuing I B. Tech at NEC. You have been invited to present a paper in the national seminar, going to be held next week at Vignan's University, Guntur. Write an e-mail letter to the Principal, NEC, requesting him to allow you to attend the seminar and present your views on the concept chosen. [14]

4. A) I) What are the chief uses of trees according to Wangari Maathai?[8+6]

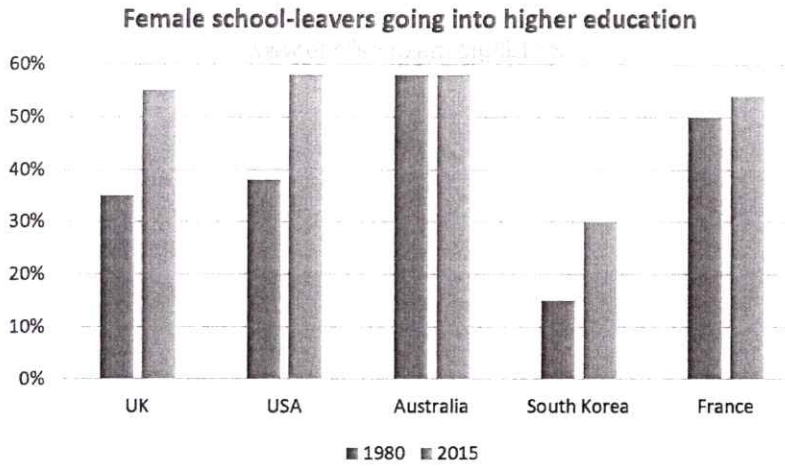II) *Transform the following sentences* as directed.
1. No other boy in our team is so clever as Raju. (Change into Superlative Degree)
2. Varshini is not bravest girl in the college. (Change into Comparative Degree)
3. Macharla is hotter than Tenali. (Change into Positive Degree)
                                    OR

B) I) *The chart gives information on the percentage of women going into higher education in five countries for the years 1980 and 2015.[14]*

Summarise the information by selecting and reporting the main features

Write at least 150 words.

Female school-leavers going into higher education

A bar chart titled "Female school-leavers going into higher education" with the y-axis from 0% to 60% and x-axis showing UK, USA, Australia, South Korea, France. Legend: ■1980 ■2015.

5. A) I) **What can you say about the book "Stay Hungry Stay Foolish" by Steve Jobs**
   II) Change the following sentences into *reported speech.[8+6]*

1. Ruchi said, "I may go there."
2. Bucky said to Steve, "Do you hear me?"
3. The boy said, "Let me come in."

OR

B) I) Match the following *GRE words* with their meanings. [14]

	A		B
1	**erudite**	A	very clear and easy to understand
2	**precipitate**	B	to cause (something) to happen quickly or suddenly
3	**prodigal**	C	a person or thing that is mysterious, puzzling, or difficult to understand
4	**opaque**	D	intensely enthusiastic or passionate
5	**assuage**	E	not able to be seen through; not easily understood
6	**equivocal**	F	to make (an unpleasant feeling) less intense
7	**lucid**	G	not easily understood or explained

Subject Code: **R20CC1102**

I B.Tech - I Semester Supple Examinations, July-2023

Linear Algebra & Calculus

Time: 3 Hours   Max.Marks:**70**.   Branch: Common to all Branches.

Note: Answer All **FIVE** Questions.   All Questions Carry Equal Marks   (5 X 14 =70M)

1.

A) I) Find the rank of the matrix

$$\begin{bmatrix} -1 & 2 & 0 & 4 & 5 & -3 \\ 3 & -7 & 2 & 0 & 1 & 4 \\ 2 & -5 & 2 & 4 & 6 & 1 \\ 4 & -9 & 2 & -4 & -4 & 7 \end{bmatrix}$$

II) Apply Gauss elimination method to solve system of equations
$x+y+2z=9$
$2x+4y-3z=1$ and $3x+6y-5z=0$

OR

B) I) Using Gauss-Seidel method , solve the following system of linear algebraic equations
$10x_1-2x_2-x_3-x_4=3$
$-2x_1+10x_2-x_3-x_4=15$
$-x_1-x_2+10x_3-2x_4=27$
$-x_1-x_2-2x_3+10x_4=-9$
Correct upto four decimal places. Perform seven iterations.

2. A) I) List the eigen values and the corresponding eigen vectors of $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$.

II) Show that the matrix $\begin{bmatrix} 2 & 1 & 3 \\ -3 & 4 & -1 \\ -1 & 1 & 2 \end{bmatrix}$ is positive definite.

OR

B) I) Verify the Cayley-Hamilton theorem for the matrix $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix}$. Find A^{-1} if exists.

II) Show that the matrix $A=\begin{bmatrix} a & h \\ h & b \end{bmatrix}, a \neq b$, is transformed to a diagonal matrix

$D=P^{-1}AP$, where P is of the form $P=\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ and $\tan 2\theta = \dfrac{2h}{a-b}$.

3.   A) I) It is given that the Rolle's theorem holds for the function
$f(x)=x^3+bx^2+cx, 1 \leq x \leq 2$ at the point $x=4/3$. Find the values of b and c.
II) Find the absolute maximum/minimum values of the function
$f(x)=\sin(x)(1+\cos(x)), 0 \leq x \leq 2\pi$

OR

B) I) Using Taylor's series, obtain the value of $\cos 31°$ correct to four decimal places.

II) Use the Lagrange's mean value theorem, show that

$$\frac{\pi}{6}+\frac{1}{5\sqrt{3}}<\sin^{-1}(x)<\frac{\pi}{6}+\frac{1}{8}$$

4.   A) I) If $z=f(x,y)$, $x=u\cos\alpha-v\sin\alpha$, $y=u\sin\alpha+v\cos\alpha$, where α is a constant, then

$$\left(\frac{\partial f}{\partial u}\right)^2+\left(\frac{\partial f}{\partial v}\right)^2=\left(\frac{\partial f}{\partial x}\right)^2+\left(\frac{\partial f}{\partial y}\right)^2.$$

II) Show that the variables $u=x-y+z$, $v=x+y-z$, $w=x^2+xz-xy$, are functionally related. Find the relationship between them.

OR

B) I) If $f(x,y)=\tan^{-1}(xy)$, find an approximate value of $f(1.1,0.8)$ using the Taylor's series of linear and quadratic approximation.

II) Find the relative maximum and minimum values of the function

$f(x,y)=2(x^2-y^2)-x^4+y^4.$

5.   A) I) Evaluate $\iint\limits_{R} xy\,dxdy$ over the region in the positive quadrant for which $x+y\leq1$.

II) Evaluate the following integral by changing the order of integration

$$\int\limits_{0}^{1}\int\limits_{x}^{\sqrt{2-x^2}}\frac{x}{\sqrt{x^2+y^2}}\,dxdy$$

OR

B) I)Evaluate $\int\limits_{0}^{1}\int\limits_{0}^{1-x}\int\limits_{0}^{1-x-y}\frac{1}{(x+y+z+1)^2}\,dzdydx$

II)Evaluate $\int\limits_{0}^{1}\int\limits_{0}^{1-x}e^{\frac{y}{(x+y)}}\,dydx$ by applying change of variables.

Subject Code: **R20CC1103**

I B.Tech - I Semester Supple Examinations, July-2023
Engineering Chemistry

Time: 3 Hours   Max.Marks:**70**.   Branch: Common to CE,ME ,ECE AIML & DS

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 14 =70M)

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1. A) I) How hardness of water can be determined using EDTA method? Explain.   [7M]
   II) Explain ion-exchange method for softening of hard water with suitable diagram. [7M]

   OR

   B) I) What do you mean by alkalinity of water? Explain the method of determination of alkalinity of water with suitable chemical reactions.   [7M]
   II) Mention the difference between temporary and permanent hardness.   [3M]
   III) Differentiate between biological oxygen demand and chemical oxygen demand.   [4M]

2. A) I) Discuss the mechanism of cationic chain polymerization with a suitable example. [7M]
   II) Define thermosetting plastics and thermoplastics with appropriate examples.   [4M]
   III) Define cetane number of a fuel and how it is influenced by the chemical structure of fuel.   [3M]

   OR

   B) I) Calculate the gross and net calorific value of a coal sample with following composition:
   C = 80%, H = 8%, N = 3%, O = 4.5%, S = 2.5%, ash = 2%.   [5M]
   II) What is cracking of a fuel? State the advantages of catalytic cracking over thermal cracking.   [3M]
   III) Explain refining of petroleum and mention boiling point ranges, and application of three important fractions obtained from crude petroleum.   [6M]

3. A) I) What are nanomaterials? Discuss the types of nanomaterials based on dimensionality with appropriate examples.   [7M]
   II) How fullerenes are prepared? Discuss properties and applications of fullerenes.   [7M]

   OR

   B) I) How chemical vapour deposition method is useful for the preparation of carbon nanotubes? Explain with suitable example.
   [5M]
   II) Define thermotropic and lyotropic liquid crystals with suitable examples.   [5M]
   III) What are fiber-reinforced composites? Mention the characteristics of fiber-reinforced composites.   [4M]

4. A) I) Explain the working principle of H_2-O_2 fuel cell with a suitable diagram and chemical reactions involved in it. Write its advantages   [14M]

   OR

   B) I) Mention differences between chemical corrosion and electrochemical corrosion.   [7M]
   II) Explain anodic coatings with a suitable example.   [7M]

5. A) I) Draw a suitable flow-diagram for the manufacture of Portland cement from raw materials. Write the chemical reactions involved in the manufacture of Portland cement.

[8M]

II) What are refractories? Mention the characteristics of a good refractory material.

[6M]

OR

B) I) Define lubricants. Discuss the classification of lubricants with suitable examples.

[8M]

II) Explain Viscosity, iodine value and saponification number of a lubricating oil.

[6M]

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NARASARAOPETA
NEC ENGINEERING COLLEGE
(AUTONOMOUS)

Subject Code: **R20CC1104**

I B.Tech - I Semester Supple Examinations, July-2023
Applied physics

Time: 3 Hours   Branch: CSE,IT,AI & CY   Max.Marks:**70**.

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 14 =70M)

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1. A) I) Distinguish between Fresnel and Fraunhofer diffraction.   [4 M]
       II) Explain qualitatively Fraunhofer diffraction due to a single slit with neat diagrams.   [10 M]

    OR

    B) I) Describe the principle, construction and working of Nicol's prism.   [10 M]
       II) Find the thickness of a quarter wave plate and half wave plate when the wavelength of light is 5890 Å. (μ_o = 1.55 and μ_e = 1.54)   [4 M]

2. A) I) Describe the construction and working of He-Ne laser with relevant energy level diagram.   [10 M]
       II) What are the advantages and disadvantages of He-Ne laser?   [4 M]

    OR

    B) I) Derive an expression for acceptance angle and discuss the concept of acceptance cone for an optical fiber.   [10 M]
       II) Calculate the acceptance angle of a given optical fiber, if the refractive indices of core and cladding are 1.58 and 1.46 respectively.   [4 M]

3. A) I) Define space lattice and unit cell.   [4 M]
       II) Find the coordination number, nearest neighbour distance, atomic radius and packing fractions of BCC lattices   [10 M]

    OR

    B) I) What are Miller indices? Derive an expression for inter-planar spacing between two consecutive planes.   [10 M]
       II) Draw the planes (011) and (101)   [4 M]

4. A) I) What are the fundamental laws of electromagnetism?   [7 M]
       II) Write the Maxwell's equation in integral and differential forms.   [7 M]

    OR

    B) I) Explain the hysteresis loop observed in ferromagnetic materials.   [7 M]
       II) Write the differences between Soft and Hard magnetic materials.   [7 M]

5. A) I) State de-Broglie's hypothesis. Derive the de-Broglie's wavelengths for various cases and mention any four properties.   [10 M]
       II) An electron is moving with a velocity of 2.9×10^3 m/s. Evaluate the de-Broglie's wavelength associated with the electron.   [4 M]

    OR

    B) I) Describe the formation of energy bands in solids.   [7 M]
       II) Explain the classification of solids into conductors, semiconductors and insulators.   [7 M]

Subject Code: **R20CC1105**

I B.Tech I Semester Supple Examinations, July-2023

Problem Solving Using C

Time: 3 Hours   Max.Marks:70   Branch: Common to CE,EEE,ECE,CSE,IT,AI,AIML,DS & CY

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks   (5 X 14 =70M)

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1. A) I) Write an algorithm and flowchart to find out whether a given number is prime number or not.
   II) Explain various levels of operator precedence and associativity in C language.

   OR

   B) I) Distinguish between all loop statements along with a flowchart and with an example program.
   II) Write a program in 'C' to check whether a given integer number is odd or even

2. A) I) Explain different looping statements with syntax and examples.
   II) Write a C Program to compare two strings for equality without using string handling function.

   OR

   B) I) Explain about the 'break', 'continue', and 'goto' statements in 'C' programming.
   II) Write a C program to find all factors of a number

3. A) I) Write a C program for matrix multiplication covering all necessary conditions.
   II) What is Recursive Function? What are the constraints for defining a Recursive function? Explain with an example.

   OR

   B) I) What is Recursion? Write a 'C' Program for Towers of Hanoi. Also specify in diagram for it.
   II) What are multidimensional arrays in C? Where are multidimensional arrays used? How does memory allocation takes place for a multidimensional array in C.

4. A) I) How are increment and decrement operations implemented with pointers?
   II) Explain in detail the memory allocation strategy for Unions and Structures.

   OR

   B) I) Write a C program to swap two numbers using pointers.
   II) Write a program to illustrate the comparison of structure variables.

5. A) I) Write a C program to append the contents of one file to another file.
   II) Define File. What are different types of Files in C programming? Explain.

   OR

   B) I) Explain the syntax and usage of ftell, fseek and rewind functions in C language.
   II) Discuss in details about various modes of operating a file.

Subject Code: **R20ME1106**

I B.Tech I Semester Supple Examinations, July-2023

Problem Solving using Python

Time: 3 Hours   Program: B.Tech.   Branch: ME.   Max.Marks:**70.**

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 14 =70M)

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1. A) I) Briefly explain about System Software?
      II) Convert the following into Decimal
          a) $(101010)_2$ b) $(0101)_8$ c) $(10010)_{16}$
                              OR
   B) I) What is operating system? What are the functionalities of OS?
      II) Define Flow chart ? Draw the flow chart for finding GCD of 2 numbers?

2. A) I) Explain about Membership operators in python with example?
      II) Explain different conditional statements in python with example?
                              OR
   B) I) Explain the history of Python evolution?
      II) Explain the rules for writing identifiers?

3. A) I) Write in brief about lambda function?
      II) How to do logo design with Turtle? Explain with an example?
                              OR
   B) I) How to Write Text with Turtle? Explain with an example?
      II) Write a short note on fruitful and void functions?

4. A) I) Explain about methods in Lists of Python with examples?
      II) What is a tuple? How literals of type tuple are written?
                              OR
   B) I) Explain the Python Dictionary Comprehension with example?
      II) Write a short note on open and close file operations?

5. A) I) Discuss about operator overloading?
      II) Write a short note on abstract class?
                              OR
   B) I) Explain inheritance class with suitable example?
      II) Distinguish between error and exception features?

I B.Tech I Semester Supple Examinations, July-2023
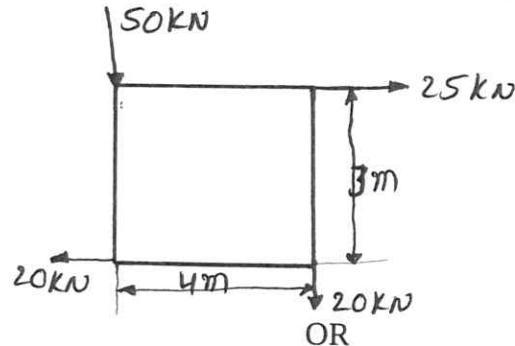### Engineering Mechanics

Time: 3 Hours   Max.Marks:**70**.   Branch: Common to CE,ME.

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks   (5 X 14 =70M)

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1. A) I) Explain about different type of force systems.   **7M**

   II) Systems of forces are acting at the corners of a rectangular block as shown in Fig. Determine the magnitude and direction of the resultant force. **7M**


OR

B) I) The wheel weighing 1000 N and of diameter 60 cm rests against a block of height 15 cm. Find the least pull through the centre of the wheel to just turn the wheel over the corner of the block. Find the reaction of the block. All surfaces are smooth. **7M**

II) Two men support a weightless wooden beam AB with a weight of 1000N hanging from the beam as shown in figure. Find the load shared by each man **7M**
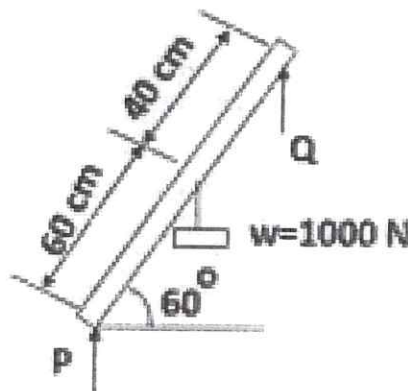
2. A) I) Find the forces in all the members of the truss shown in Fig 10M
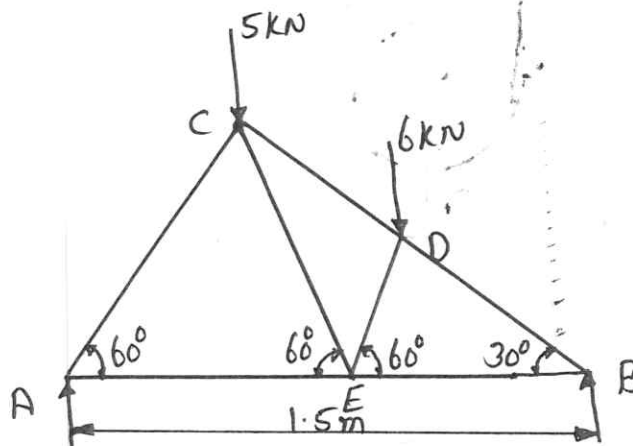
II) What are the assumptions made while analysing plane truss problems.? **4M**

<div align="center">OR</div>

B) I) A body resting on a rough horizontal plane required a pull of 82 N inclined at 30^0 to the plane just to move it. It was found that a push of 100 N inclined at 30^0 to the plane just moved the body. Determine the weight of the body and the coefficient of friction. **8 M**

II) State the laws of static and dynamic friction. **6 M**

3. A) I) Find the centroid of the plane lamina shown in Figure 14M
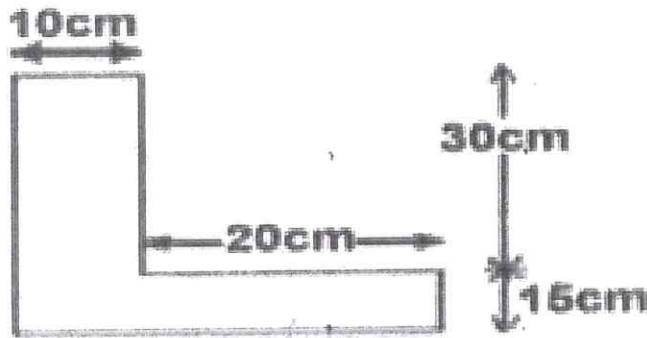
<div align="center">OR</div>

B) I) Determine the centroid for a circular cross section of diameter "D". 8M

II) Sate and prove Pappus theorem II 6M

4. A) I) State and prove parallel axis theorem. 7M

II) Determine the mass moment of inertia of a circular plate of uniform thickness, about centroid axis. **7M**

<div align="center">OR</div>

B) I) A I section is made up of top flange, 80x20 mm, web 120x20 mm and bottom flange 100x20 mm. Find out area moment of inertia of the section **14M**

5. A) I) Differentiate Work-Energy Principle and Impulse- Momentum Principle **6M**

II) In the pulley system shown in figure, the masses of blocks A and B are 24 kg and 12 kg respectively. The masses of pulley and rope can be neglected. Find the velocity of the blocks 3.5 seconds after they start from rest. **– 8M**
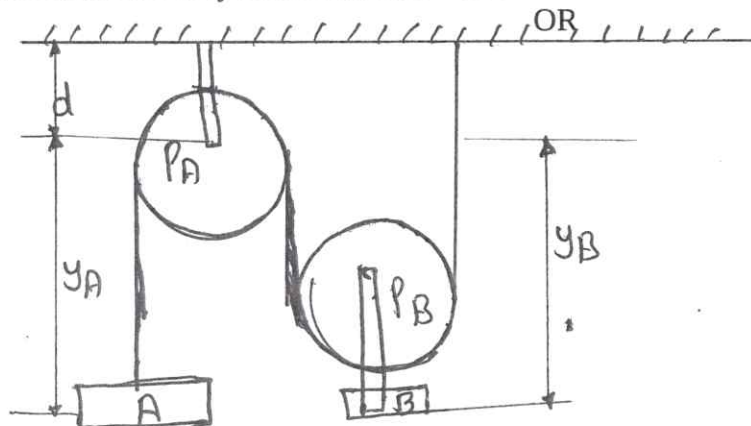
B) I) Derive the exspression for De-Alembert's principle. 7M

II) State Newton's laws of motions in detail. **7M**

I B.Tech - I Semester Supple Examinations, July-2023

Basics in Mechanical and Civil Engineering

Time: 3 Hours   Max.Marks:**70**.   Branch: EEE.

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks (5 X 14 =70M)

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1. A) I) Draw the general layout of steam power plant and also explain each component. 7M
   II) Discuss the advantages and disadvantages of a diesel engine. 7M

   OR

   B) I) Give the advantages and limitations of gas turbine power plants. 7M
   II) Differentiate between steam power plant gas power plant. 7M

2. A) I) Explain in detail about power transmission in flat belts and crossed belts. 7M
   II) What are the advantages and disadvantages of rope drives and chain drives. 7M

   OR

   B) I) Discuss the merits and demerits of gear drive over a belt drive for power transmission. 7M
   II) What are the different types of gears? Explain with neat sketch helical gears and bevel gears. 7M

3. A) I) Deduce the expression for the force exerted by a jet of water on a flat stationary plate in the direction of jet. 7M
   II) A jet of water of diameter 10 cm strikes a flat plate normally with a velocity of 15 m/s. The plate is moving with a velocity of 6 m/s in the direction of the jet and away from the jet. Find: i) the force exerted by the jet on the plate. ii) work done by the jet on the plate per second. 7M

   OR

   B) I) Explain the working principle of centrifugal pump with neat sketch. 7M
   II) Differentiate between centrifugal pump and reciprocating pump. 7M

4. A) I) Explain briefly different types of chains? 7M
   II) Mention the different principles in surveying? List the functional classification in surveying? 7M

   OR

   B) I) State and explain triangle law of forces, polygon law of forces? 7M
   II) Explain the process of manufacture of concrete in detail? 7M

5. A) I) Explain about the different types of stones? 7M
   II) How bricks are classified? What are the properties of first-class bricks? 7M

   OR

   B) I) Explain briefly about grading of aggregates? 7M
   II) List out the physical properties of cement and explain any one in detail? 7M

I B.Tech - I Semester Supple Examinations, July-2023
Engineering Drawing and Design

Time: 3 Hours   Max.Marks:**70**.   Branch:EEE.

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks   (5 X 14 =70M)

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1. A) The foci of an ellipse are 90 mm apart and the minor axis is 65 mm long. Determine the length of the major axis and draw half the ellipse by concentric-circles method and the other half by oblong method. Draw a curve parallel to the ellipse and 25 mm away from it.

   OR

   B) Construct a hyperbola when the distance between the focus and directrix is 45 mm and eccentricity is 5/4. Also draw the tangent and normal to any point on the curve.

2. A) I) Mark the projections of the following points on a common reference line:
   P, 35 mm behind the VP and 20 mm below the HP.
   O, 40 mm in front of VP and 30 mm above the HP.
   R, 50 mm behind the VP and 15 mm above the HP.
   S, 40 mm below the HP and in the VP.

   II) A point P is on HP and 20 mm in front ot VP. Another point O is also on HP and behind VP. The distance between their end projectors is 60 mm. Draw its projections it the line joining P & Q makes an angle of 60^0 with the reference line. Also find the positions of point P and Q

   OR

   B) The top view of a straight line PQ is 70 mm and makes an angle of 60 with XY line. The end Q is 10 mm in front of VP and 30 mm above the HP. The difference between the distances of P and Q above the HP is 45 mm. Draw the projections. Determine its true length and true inclinations with HP and VP.

3. A) A rectangular lamina of 35mm x 20mm rests on HP on one of its shorter edges. The lamina is rotated about the edge on which it rests till it appears as a square in the top view. The edge on which the lamina rests being parallel to both HP and VP. Draw its projections and find its inclinations to HP and VP.

   OR

   B) A hexagonal lamina of sides 30mm is resting with one of its corners in VP and its surface inclined at an angle of 30° with VP. The diagonal passing through that corner which is in VP appears to be inclined at 45° to HP. Draw the projections of the lamina.

4. A) A square prism 35mm sides of base and 60mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30°. Draw the projections of the prism when the axis is inclined to the HP at 45°.

   OR

   B) A cone of base diameter 40mm and axis length 50mm is resting on HP on a point on the circumference of its base such that its apex is at 40mm above the HP and its top view of the axis is inclined at 60° to VP. Draw the top and front views of the solid. Also, determine the inclinations of the axis when base is nearer to the observer.

5. A) Draw the three orthographic views for the following fig
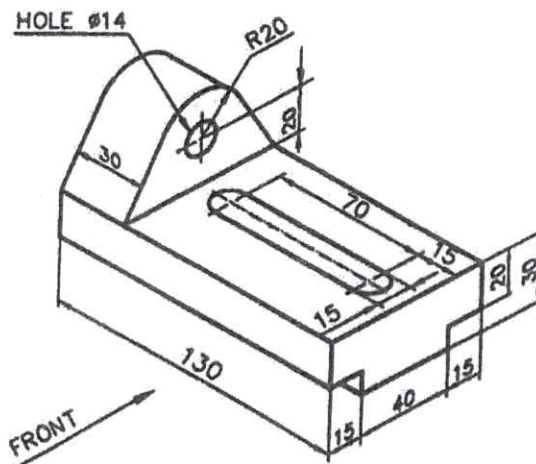
HOLE ⌀14
R20
30
20
70
15
15
20
30
130
40
15
15
FRONT

OR

B) Below fig. shows the front and top view of a solid. Draw the isometric projection of the solid.

30
20
15
☐30
⌀50
☐ 70
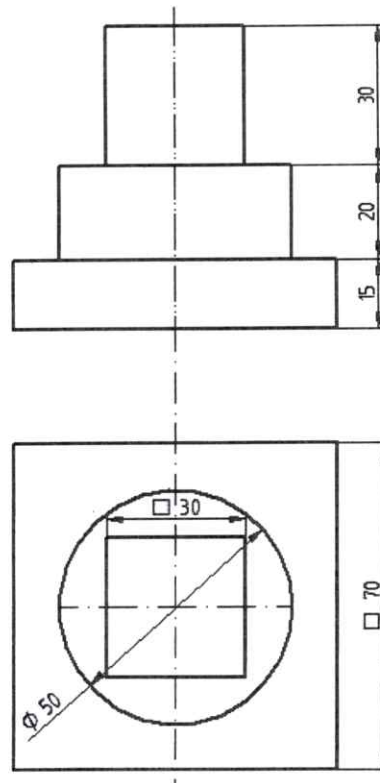
Subject Code: **R20EC1108**

I B.Tech - I Semester Supple Examinations, July-2023
Engineering Graphics

Time: 3 Hours   Max.Marks:**70**.   Branch: ECE.

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 14 =70M)

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1. A) Construct a parabola when the distance between the focus and directrix is 30mm. Also draw the tangent and normal to any point on the curve.

   OR

   B) Inscribe an ellipse in a parallelogram having sides 150 mm and 100 mm long and included angle 120^0. Draw tangent and normal at 60 mm from focus. Also draw a parallel ellipse at 20mm outside the original ellipse.

2. A) I) Mark the projections of the following points on a common reference line:
   P, 35 mm behind the VP and 20 mm below the HP.
   O, 40 mm in front of VP and 30 mm above the HP.
   R, 50 mm behind the VP and 15 mm above the HP.
   S, 40 mm below the HP and in the VP.

       II) A point C is on HP and 15 mm behind VP. Another point D is also on HP and 40 mm in front of VP. The distance between their protectors is 45 mm. Join their front views and determine inclination of this line with XY line.

   OR

   B) The point B of a line AB is on the horizontal plane, the top view of the line makes an angle of 30° with XY line, being 80mm. The point A is on the vertical plane and 50mm above the horizontal plane. Draw the top and front views of the line and obtain the true length of the line. Also find the inclinations of the line with the two planes

3. A) An isosceles triangular plate of negligible thickness has a base 25mm long and altitude 35mm. It is so placed on HP such that in the front view it is seen as an equilateral triangle of 25mm sides with the side that is parallel to VP is inclined at 45° to HP. Draw its top and front views. Also determine the inclination of the plate with the reference plane.

   OR

   B) A regular hexagonal lamina of sides 25mm is lying such a way that one of its sides on HP while the side opposite to the side on which it rests is on VP. If the lamina makes 60° to HP, draw the projections of the lamina.

4. A) A pentagonal prism 25mm sides of base and 60mm axis length is suspended freely from one of its corners. Draw the projections of prism when the axis appears to be inclined to VP at 45°.

   OR

   B) A cylinder of base diameter 50mm and axis height 65mm is resting on HP on a point on the circumference of the base with its axis inclined at 50° to HP and parallel to VP. Draw its projections.

5. A) Draw the front, top and side views of the fig. shown below.
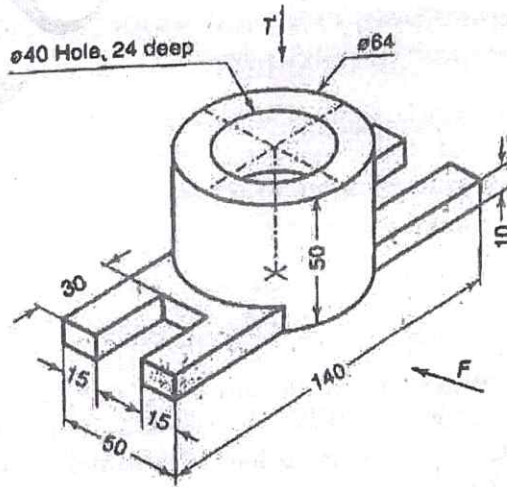
ø40 Hole, 24 deep
ø64
30
50
15
15
50
140
10
F
T

OR

B) Below fig. shows the front and top view of a solid. Draw the isometric projection of the solid.
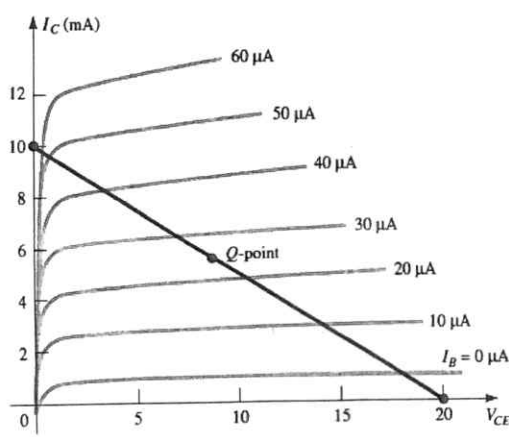

30
20
15
□30
□70
Ø 50
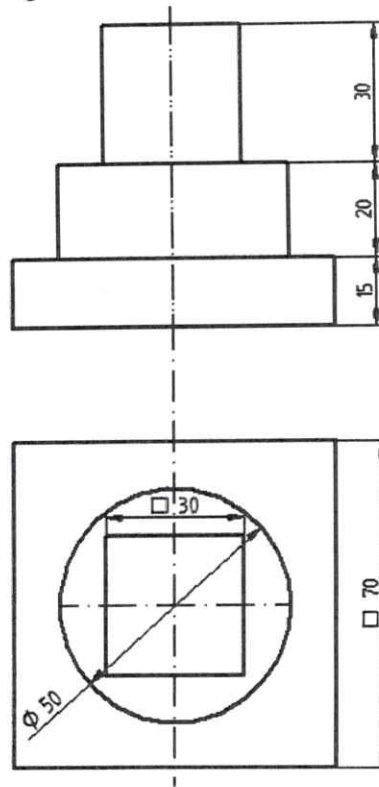
Subject Code: R20CC1111

I B.Tech - I Semester Supple Examinations, July-2023
Electronic Devices and Logic Design
(AIML,CS & DS)

Time: 3 hours

Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 14 =70M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	(i) Explain the following terms for a PN diode a) Dynamic Resistance, b) Load Line c) Depletion region, d) Ideality factor e) Reverse Saturation Current	2	1	5M
		ii) A Reverse Voltage of 90Vis applied to Germanium diode through a resistance R. The reverse Saturation Current of the diode is 50 μA at an operating temperature of 25^{0}C. Compute the diode Current and Voltage for i. R = 10 MΩ ii. R = 100 MΩ	2	1	9M
		OR			
	b	i) Draw and explain the V-I characteristics of PN diode and discuss the importance of each term of diode current equation.	2	1	7M
		(ii) How is Zener diode used as a voltage regulator?	2	1	7M
2		**Unit-II**			
	a	i) Explain in detail the construction and operation of depletion mode n-channel MOSFET. Draw and explain its characteristics.	2	2	7M
		ii) Given the load line of below Figure and the defined Q -point, determine the required values of V_{CC}, R_C, and R_B for a fixed-bias configuration.	2	2	7M

		OR			
	b	(i) With the help of input and output characteristics explain the operation of a BJT in common emitter configuration.	2	2	7M
		ii) Explain the importance of biasing through potential divider bias. Describe the need of bias compensation methods.	2	2	7M
		Unit-III			
3	a	i) Determine the minimum SOP form of the Boolean function $F(A,B,C,D) = \sum m\ (3,5,7,8,10,11,12,13)$ using K-Map and implement with NAND gates.	3	3	7M
		ii) Express the following Boolean functions in maxterm form and minterm form:- (a) $F(A, B, C) = \prod M(0, 3, 7)$ (b) $F (A, B, C) = \sum m\ (0,2,4, 5, 6)$	2	3	7M
		OR			
	b	i) Convert the number $(17.125)_{16}$ to base 10, base 4, base 5 and base 2	2	3	7M
		ii) Minimize the following Boolean function using K-Map:- $f(w,x,y,z) = \sum m\ (1,3,7,11,15) + \sum d\ (0, 2, 5)$	2	3	7M
		Unit-IV			
4	a	i) Construct the logic diagram of Master slave Flip-Flop and explain it's operation?	4	4	10M
		ii) Construct a 16×1 multiplexer with two 8×1 and one 2×1 multiplexers. Use the block diagrams of 8×1 and one 2×1 multiplexers.	4	4	4M
		OR			
	b	i) Write the characteristic, excitation tables for JK, RS, T and D flip-flops.	1	4	7M
		ii) Implement full adder using minimum number of NAND gates	4	4	7M
		Unit-V			
5	a	(i) Design a left shift and right shift for the following data 11011100	4	5	7M
		ii) Design a binary ripple counter, which is capable of counting 5000 number of people passing through an entrance of gate. Each time people passes a given point, a pulse is generated that can be used as a clock input.	4	5	7M
		OR			
	b	(i) Write the differences between synchronous and asynchronous counters.	1	5	7M
		ii) Design a modulus 12 counter and also find frequency at the last flip-flop (Q3) output, if the input frequency is 1.2MHZ.	4	5	7M