R20

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Regular Examinations, September 2021
Basic Electrical Engineering
(EEE & ECE)

Roll No										

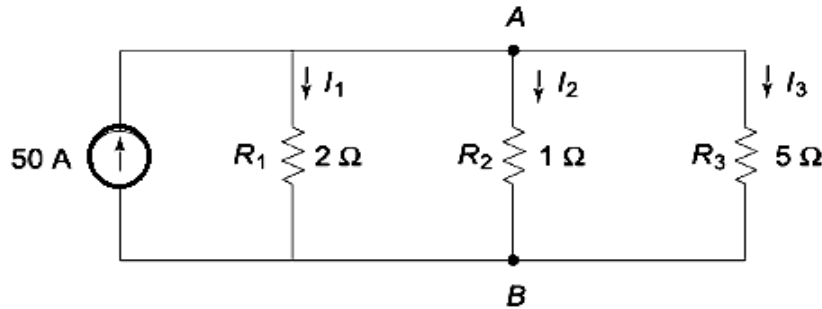**Time: 3 hours**   **Max. Marks: 70**
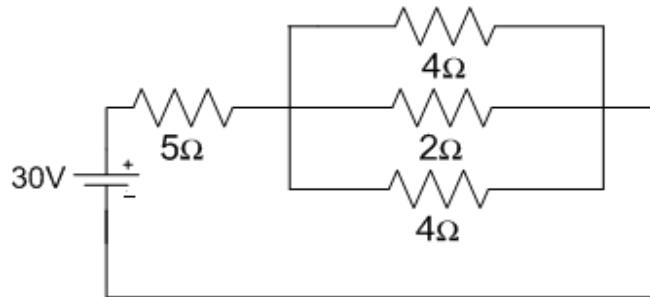
Answer Any **Five** Questions
All Questions carries equal marks.
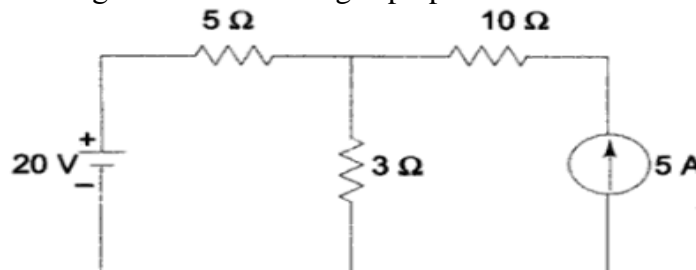*****

1(a) Derive voltage, current and power relations in R & L elements.   **[7M]**

(b) Determine the current in all resistors in the circuit using KCL.   **[7M]**

**2(a)** Summarize the types of energy sources used in electrical circuits   **[7M]**
(b) Determine the total current in the circuit   **[7M]**

3(a) Find the current through 3Ω resistor using superposition theorem in the circuit   **[7M]**

(b) Discuss the steps to determine the Norton's equivalent circuit. **[7M]**

4(a) Illustrate the source transformation technique with an example. **[7M]**

(b) Using star- delta transformation, determine the current drawn by the source in the **[7M]** circuit shown in the fig.
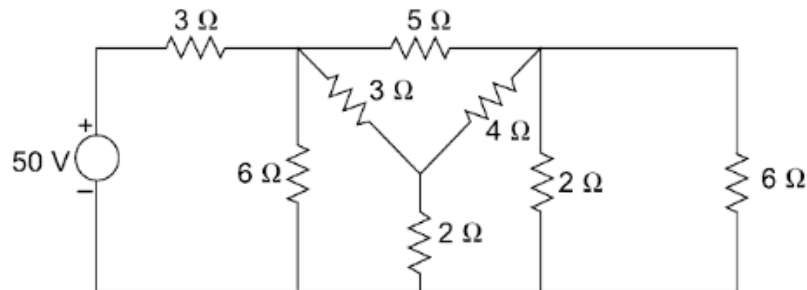
5(a) Illustrate the crest factor and form factor of a sine-wave. **[7M]**
(b) An AC circuit consists of a pure resistance of 10Ω and is connected across an AC **[7M]** supply of 230V, 50Hz. Calculate (i) Current   (ii) Power consumed   (iii) Power factor   (iv) write down the equations for voltage and current.

6(a) Derive the equation of RMS value of sinusoidal waveform. **[7M]**
(b) Explain the response of series RL circuit with AC input **[7M]**

7(a) Derive an emf equation of a transformer. **[7M]**
(b) Describe the constructional details of transformer. **[7M]**

8(a) Discuss the necessity of earthing in electrical equipments. **[7M]**
(b) Illustrate the operation of Miniature Circuit Breaker (MCB) **[7M]**

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R20

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Regular Examinations, September 2021
Computer Aided Engineering Graphics
(EEE & ECE)

Roll No										

Time: 3 hours   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks
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1   Construct a regular pentagon with the length of the side 40mm using general method.   **14M]**

2   (a) Divide a circle of radius 50 mm into eight equal parts.   **[7M]**
     (b) Divide a line 100 mm into seven equal parts.   **[7M]**

3   (a) A point A is 30mm above the H.P. and 40mm in front of the V.P. Draw its Projections.   **[4M]**
     (b) A point A is 25mm below the H.P. and 35mm behind the V.P. Draw its Projections.   **[4M]**
     (c) A Point B is 20 mm above the HP and 30 mm behind the VP draw its projections.   **[6M]**

4   A line CD of 100 mm length is inclined at 30^0 to HP and 45^0 to VP. The point A is 15 mm above HP and 20mm in front of VP. Draw the projections of the line.   **[14M]**

5   A thin circular plate of 70mm diameter is resting on its circumference such that its plane is inclined 60^0 to the H.P and 30^0 to the V.P. Draw the projections of the plate.   **[14M]**

6   Draw the projections of a hexagonal pyramid, base 30mm side and axis 60mm long, having its base on the H.P. and one of the edges of the base inclined at 45^0 to the V.P.   **[14M]**

7   **a)** Draw the isometric view of a cylinder of base diameter 50 mm and axis 60 mm lying on one of its base on the H.P   **[7M]**
     b) A square prism of base edge 40 mm and axis 60 mm has an edge of its base on the H.P draw its isometric view   **[7M]**

8   Draw the (i) Front view (ii) Top View (iii) Side view of the Following Isometric Drawings   **[14M]**
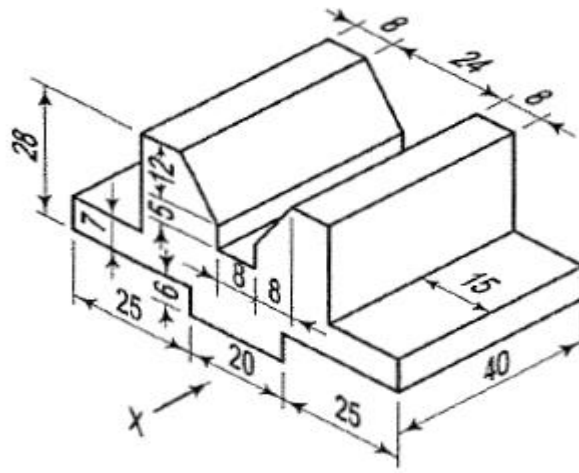
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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Regular Examinations, September 2021
Basic Electrical and Electronics Engineering
(ME & AE)

Roll No										

Time: 3 hours   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1		Explain the concept of Source transformation and show the procedure to convert Voltage source to Current source and vice-versa.	[14M]
2		What are the Independent and Dependent sources and explain them with examples for current and voltage sources?	[14M]
3		State and Explain Thevenin's Theorem with one example.	[14M]
4		Derive the expressions for Star–to-Delta and Delta-to-Star Transformations for Resistive Networks.	[14M]
5	a)	Explain the constructional features of a DC generator	[7M]
	b)	Explain the Principle of operation of DC Motor.	[7M]
6	a)	Derive the induced EMF equation of DC Generator.	[7M]
	b)	Explain the constructional features of a transformer.	[7M]
7		Develop the circuit diagram of half wave and full wave rectifiers and explain their operation.	[14M]
8		Draw the equivalent circuit for an NPN common base transistor and explain in detail.	[14M]

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Regular Examinations, September 2021
Engineering Graphics
(ME & AE)

Roll No										

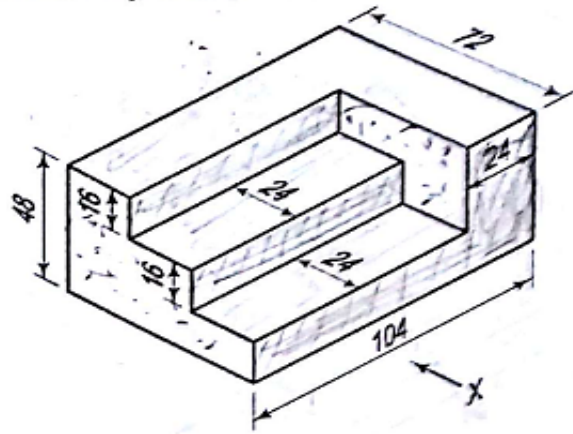**Time: 3 hours**   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1 a.	Construct a regular hexagon of side 35 mm when one side is horizontal.	**[7M]**
b.	Construct a plain scale to show meters and decimeters and long enough to measure upto 6 meters. R.F of the scale is 1/50. Show on the scale a distance of 4 meters and 7 decimeters.	**[7M]**
2	Construct a parabola when the distance between focus and the directrix is 40 mm. Draw tangent and normal at any point 'P' on the curve.	**[14M]**
3 a.	A line AB 50 mm long makes an angle 45° to the V.P. The end A is 15 mm in front of V.P and 12 mm above the H.P. Draw the front view and top view of the line AB.	**[7M]**
b.	A line MN 50 mm long is parallel to V.P and inclined at 30° to H.P. The end M is 20 mm above H.P and 10 mm in front of V.P. Draw the projections of the line.	**[7M]**
4	A line CD 80 mm long is inclined at an angle of 30° to H.P and 45° to V.P. the point C is 20 mm above H.P and 30 mm in front of V.P. Draw the projections of the straight line.	**[14M]**
5	A regular pentagonal plane of 25 mm side, has one side on the H,P. Its plane is inclined at an angle of 30° to the H.P. and perpendicular to the V.P. Draw the projections of the pentagon.	**[14M]**
6	A pentagonal pyramid side of base 25 mm and height 60 mm has one of its slant faces on the horizontal plane and the edge of the base contained by that slant face makes an angle of 30° to the V.P. Draw its projections.	**[14M]**
7	Draw an isometric projection of a pentagonal prism of base side 30 mm and axis 75 mm. The prism rests on its base on the HP with an edge of the base parallel to the VP.	**[14M]**

8 Draw the (i) Front view (ii) Top View (iii) Side view of the Following Isometric **[14M]** Drawings.

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Regular Examinations, September 2021
Professional English
(Common to all branches)

Roll No | | | | | | | | | |

Time: 3 hours   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1   a. Write do's and dont's of group discussion.   **[7M]**
      b. Describe your favourite uncle/aunt in about 100 words.   **[7M]**

2   a. Choose the correct alternative.   **[7M]**
      1. What would you do if it _____ on your wedding day?
        a. rained   b. will rain   c. would rain
      2. If she comes, I _____ call you.
        a. will   b. would   c. would have
      3. If you eat a lot of peanut butter, you _____ sick.
        a. would have gotten   b. would get   b. will get
      4. What will you do if you _____ the physical test?
        a. would fail   b. will fail   c. fail
      5. If they had not _____ the car, I would have driven you.
        a. take   b. taken   c. would take
      6. If it snows, _____ still drive to the coast?
        a. will you   b. would you   c. would you have
      7. "He would have gone with you if you had asked him." Which conditional is this?
        a. first   b. second   c. third

      b. Complete the sentences with the correct alternative.   **[7M]**
      1. If she had studied harder, she _____ (would / would have) passed the exam.
      2. If I won the lottery, I _____ (will / would) buy a big house.
      3. If I hadn't gone to bed so late, I _____ (wouldn't / wouldn't have been) tired.
      4. If I go out tonight, I _____ (will / would) go to the cinema.
      5. If I were the Prime Minister, I _____ (will / would) abolish all the exams.
      6. If she hadn't stayed at home, she _____ (would go / would have gone) shopping.
      7. If I hadn't eaten so much, I _____ (wouldn't / wouldn't have) felt sick.

3   Assume that you have a technical presentation to make in conference. Discuss some effective tips and techniques to be followed to make your presentation impactful to your audience.   **[14M]**

4   Identify the errors in the following sentences and rewrite them after making necessary corrections.   **[14M]**
      i. I have visited Taj Mahal in Agra last year.
      ii. Although it was raining heavily, but we had to continue the programme.
      iii. My niece can be able to drive.
      iv. When I will reach home, I will let you know.

v. All my students speak English good.

vi. Ramu has been studying since four hours.

vii. The little girl closed very gently the door.

5 What is the importance of interview preparation? Write a step-by-step process of **[14M]** your preparation assuming that you are going to face a job interview next week.

6 a. Differentiate between a transitive and an intransitive verb with suitable **[7M]** examples.

b. Identify the highlighted verbs in the following sentences as transitive or **[7M]** intransitive.
   i.   Her plants GROW very healthy during the rainy season.
   ii.   The little boy TASTED the curry his father had cooked.
   iii. Krishna TURNED red with anger.
   iv.   Roshan HIT the ball hard.
   v.   They all WALKED slowly along the approach road.
   vi.   My mother was SPEAKING softly over the phone.
   vii. Did you READ the article in today's newspaper?

7 a. Fill in the correct form of the words in brackets (comparative or superlative). **[7M]**

   1. My car is (big) _____ than yours.
   2. Which is the (dangerous) _____ animal in the world?
   3. A holiday by the sea is (good) _____ than a holiday in the mountains.
   4. Non-smokers usually live (long) _____ than smokers.
   5. Who is the (rich) _____ woman on earth?
   6. The weather this summer is even (bad) _____ than last summer.
   7. He was the (clever) _____ thief of all.

b. Find out the relationship between the first two words and choose the word from **[7M]** the given alternatives, which bears the same relationship to the third word.
i. Fast is to Running as Slow is to _____?
  a) Walking   b) Pace c) Turtle d) Lazy
ii. Eagle is to Bird as Rose is to _____?
  a) Fruit   b) Flower c) Plant d) Water
iii. Speed is to Fast as Temperature is to _____?
  a) Thermometer   b) Warm c) Weather d) Earth
iv. Planet is to Ball as Dice is to _____?
  a) Apple   b) Football c) Cube d) Round
v. Oven is to Bake as Refrigerator is to _____?
  a) Heat   b) Chill c) Cook d) Store
vi. Badminton is to Shuttlecock as Cricket is to _____?
  a) Ball   b) Stump c) Pitch d) Umpire
vii. Writing is to Pen as Chopping is to _____?
  a) Mask   b) Shoes c) Comb d) Axe

8 Write short notes on the following giving suitable examples.(six minimum each)
   a.   homonyms   **[5M]**
   b.   homophones   **[5M]**
   c.   homographs   **[4M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Regular Examinations, September 2021
Mathematics-II
(Common to all branches)

Roll No										

Time: 3 hours   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1   (a). Find the root of the equation $x^3 - 5x + 1 = 0$ using Bisection method in 5   **[7M]**
stages.

(b). Find the positive root of the equation $f(x)=x^3−2x−5=0$ by Newton Raphson   **[7M]**
method.

2   (a). Find f(2.5) using Newton's forward formula from the following table   **[7M]**

x	0	1	2	3	4	5	6
y	0	1	16	81	256	625	1296

(b).Given $u_0 = 580, u_1 = 556, u_2 = 520\ and\ u_4 = 385$ find u_3. by   Lagrange's   **[7M]**
Interpolation formula.

3   (a). Fit a straight line to the following data   **[7M]**

x	0	1	2	3	4
y	1	1.8	3.3	4.5	6.3

(b). Compute $\int_0^4 e^x dx$ by using Simpsons' one third rule with 10 subdivisions.   **[7M]**

4   Using Runge-Kutta method find y(0.2) and y(0.4) given $y'=y+e^x$, y(0)=1   **[14M]**

5   (a). Form the partial differential equation by eliminating arbitrary constants   **[7M]**
$z = ax^3 + by^3$.

(b). Solve the partial differential equation $p\sqrt{x} + q\sqrt{y} = \sqrt{z}$.   **[7M]**

6   Solve $(x^2 - yz)p + (y^2 - zx)q = (z^2 - xy)$.   **[14M]**

7   (a). Evaluate $\int_0^2 \int_0^x y\ dy\ dx$.   **[7M]**

(b). Evaluate $\iint xy(x + y)\ dx\ dy$ over the region R bounded by $y = x^2$ and $x = y^2$.   **[7M]**

8   (a). Find the directional derivative of the function $f = x^2 - y^2 + 2z^2$ at the point   **[7M]**
P=(1,2,3) in the direction of the line PQ where Q=(5,0,4).

(b). If $f = xy^2 i + 2x^2 yz\ j - 3yz^2\ k$ find *curl f* at the point (1,-1,1).   **[7M]**

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Code No: **R20A0502**
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Regular Examinations, September 2021
Python Programming
(Common to all branches)

Roll No										

Time: 3 hours   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1	a.	Enumerate the list and its methods with example.	**[7M]**
	b.	Elucidate the string and its methods with example.	**[7M]**

2	a.	What is dictionary? Explain the methods available in dictionary.	**[7M]**
	b.	Differentiate between the tuple and sets in python.	**[7M]**

3	a.	What is the inbuilt function used to read the input from the keyboard. Give an example.	**[7M]**
	b.	How to declare multiple variables in one line in python. How to perform variable assignment in a single line for different data types.	**[7M]**

4	Describe the identity operators in python with an example. Write a python Program to test for presence of key in a dictionary.	**[14M]**

5	a.	How break and continue statements are used to alter the flow of a loop with an example.	**[7M]**
	b.	Write a python program to display powers of 2 using anonymous function.	**[7M]**

6	Explain the syntax of the following statements with examples.	**[14M]**
	i) for loop ii) while loop iii) if - else iv) if-elif-else	

7	a.	Define function? Write its syntax.	**[7M]**
	b.	Explain lambda function with an example.	**[7M]**

8	a.	Why python can have an optional finally clause. Why is it used?	**[7M]**
	b.	Illustrate with an example how exceptions are raised when error occurs at runtime.	**[7M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Regular Examinations, September 2021
Analog and Digital Electronics
(CSE, CSE-AI&ML, CSE-CS, CSE-DS, CSE-IOT & IT)

Roll No

Time: 3 hours   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1   Construct a PN-junction diode and illustrate the formation of the depletion region   **[14M]**
in a p-n junction. How does the width of this region change when the junction is:

    i.   Forward biased

    ii.   Reverse biased

At the temperature of 27oC, calculate the thermal voltage.

2 a)   Explain the V-I characteristics of Zener diode?   **[7M]**

2 b)   Draw the equivalent circuits of diode.   **[7M]**

3 a)   Explain different current components in a transistor.   **[7M]**

3 b)   In a germanium transistor collector current is 51mA, when base current is   **[7M]**
0.04mA. If $h_{fe} = \beta_{dc} = 51$, Calculate cut off current, I_{CEO}.

4 a)   Draw the circuit diagram of a transistor in CB configuration and explain the output   **[7M]**
characteristics with the help of different regions.

4 b)   Explain the input and output characteristics of a transistor in CC configuration.   **[7M]**

5   With the help of neat sketches and characteristic curves explain the construction &   **[14M]**
operation of a JFET and mark the regions of operation on the characteristics.

6 a)   Explain the construction and principle of operation of Enhancement mode   **[10M]**
N-channel MOSFET.

6 b)   Compare BJT & FET.   **[4M]**

7 a)   Express the following numbers in decimal and Hexadecimal:
     (i) $(26.24)_8$ **[4M]**
     (ii) $(1011011)_2$ **[3M]**

7 b)   Convert the following numbers to Binary
        (i) $(27.315)_{10}$ **[4M]**
        (ii) $(68BE)_{16}$ **[3M]**

8   Simplify the following Boolean functions using K-map:
     (i) $F(A,B,C,D) = \sum m(0,2,8,9,10,15) + d(1,3,6,7)$ **[7M]**
     (ii) $F(A,B,C,D) = \Sigma m(1,2,4,7,9,11,13,15)$ **[7M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Regular Examinations, September 2021
Applied Physics
(CSE, CSE-AI&ML, CSE-CS, CSE-DS & CSE-IOT & IT)

Roll No

Time: 3 hours   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1   (a) Explain Ruby laser in detail.   **[12M]**
   (b) Joe, Krish, Tarun are close friends. Joe said he can construct a laser **[2M]**
   with two level laser. But both Krish and Tarun has not accepted his
   statement. Krish said he can construct a continuous output laser with
   three level laser. But Tarun said both of the statement is wrong. Justify
   your answer and give correct explanation with energy level diagram

2   (a) Derive an expression for acceptance angle for an optical fiber. How is **[10M]**
   it related to numerical aperture?
   (b)   In an optical fiber, the core refractive index is 1.4513 and the
    cladding refractive index is 1.4468. what is   **[4M]**
     (i)   Critical incident angle?
     (ii)   Acceptance angle?
     (iii)   The numerical aperture

3   (a) Describe in detail the Davisson and Germer experiment for the **[10M]**
   confirmation of the de-Broglie hypothesis.

   (b) In physics laboratory experiment, an electron microscope is used to **[4M]**
   locate an electron in an atom within a distance (uncertainty in position)
   of 0.2Å. What is the uncertainty in the momentum of the electron located
   away?

4   (a) Derive the Time Independent schrodinger Wave equation   **[10M]**
   (b) Let us consider a particle is moving in one- dimensional potential box **[4M]**
    of width 25 Å. Calculate the particle energy in the first three energy
    levels.

5   Define density of states and derive expression for density of state factor.   **[14M]**

6 (a) Give an account of band theory of solids based on the Kronig – Penney model with neat diagram. **[10M]**

(b) Explain the classification of metals, semiconductors and insulators based on the band theory of solids. **[4M]**

7 (a) Derive the expression for concentration of electrons in intrinsic semiconductor **[10M]**

(b) Draw the I-V characteristics of a p-n junction. **[4M]**

8 (a) Discuss the soft and hard magnetic materials **[7M]**
(b) Ferri and antiferro magnetic materials **[7M]**

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