Hall Ticket Number :										

R-14

Code: 4GC11

B. Tech. I Year Supplementary Examinations December 2015

English

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)

****

UNIT–I

1. Discuss the character sketch of Rahamat in Cabuliwallah 14M

OR

2. a) Write about the early life and inventions of G.D Naidu 7M

   b) How would the alternative technology suggested by writer make things better? 7M

UNIT–II

3. E.K. Federov says “The modern life requires balanced understanding and adjustment to climate and other natural elements”. - give reasons and recommendations to support this statement. 14M

OR

4. a) What is the theme of “IF” poem? Use examples from the poem to support your ideas. 7M

   b) **Write the correct form of the verb for the following sentence:**

   i. My family ____ (buy) some land in southern France recently. They ____ (build) a summerhouse there at the moment.

   ii. Jonathon _____ (watch) the news on TV every day and it _____ (help) him with his English.

   iii. My car _____ (break) down when I _____ (drive) home from work.

   iv. When he _____ (found) Microsoft, Bill Gates was only 20 years old. He had _____ (already write) his first computer programme six years earlier.

   v. I _____ (just see) the film “The Da Vinci Code”.– Have _____ (you see) it too?

   vi. Unless he _____ (sell) more he won’t_____ (get) much money.

   vii. Agnes ____ (be)_____ (work) at bank since 2009 7M

UNIT–III

5. Why does Spain figure among the top countries in the world as well as Europe that are using solar power? 14M

OR

6. What types of conflict do you see in the story of *"The Gift of the Magi*"?- discuss 14M

UNIT–IV

7. ”Water: the Elixir of Life”. Justify the title that constitute conversation and utilization of water is thus fundamental for human welfare? 14M

OR

8. a) Write a report to the Indian Express to create awareness about the preventive measures to control the breeding of mosquitoes. 7M

   b) Write about early life and education of Jagadish Chandra Bose? 7M

UNIT–V

9. What does the lesson “*The Secret of Work*” tells us about being unattached in all that we do?- discuss 14M

OR

10. What changes did Bhabha bring about in the scientific world in India? 14M

***

Hall Ticket Number :										

R-14

Code: 4GC13

B. Tech. I Year Supplementary Examinations December 2015

Engineering Chemistry

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)

****

UNIT–I

1. a) Give the detailed procedure for the estimation of dissolved oxygen present in water with principle and chemical equations. 8M

   b) Explain why NH_4Cl+NH_4OH buffer is added in the determination of hardness in water by EDTA 6M

OR

2. a) What is breakpoint chlorination? State its significance 6M

   b) Explain the Ion exchange process for the removal of hardness of water with a neat diagram 8M

UNIT–II

3. a) Explain various factors influence the corrosion of metals 10M

   b) Describe sacrificial anodic protection 4M

OR

4. What are batteries? Describe the construction of Lead-acid battery with the reactions occurring during charge and discharge. 14M

UNIT–III

5. Explain any two moulding techniques of plastics with neat labelled diagrams 14M

OR

6. a) Describe doped conducting polymers with suitable examples 8M

   b) Write a note on vulcanization of rubber 6M

UNIT–IV

7. Give an account of the different methods used for the synthesis of petrol 14M

OR

8. A sample of coal was found to have the following percentage composition
   C = 75%, H+5.2%, O=12.1%, N=3.2%, ash=4.5%.
   (i) Calculate the weight & volume of air required of combustion of 1kg of coal 8M
   (ii) Calculate the higher calorific value and lower calorific value of coal sample 6M

UNIT–V

9. What is meant by setting and hardening of cement? Write the chemical reactions that take place during setting and hardening of cement concrete and explain 14M

OR

10. What are viscosity and viscosity index of lubricating oil? Discuss the functions of lubricants 14M

***

Hall Ticket Number :										

R-14

Code : 4G513

B.Tech. I Year Supplementary Examinations December 2015

Engineering Drawing

(Common to EEE, ECE, CSE & IT)

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

Answer *all five* units by choosing one from each unit (5 x 14 = 70Marks)

****

UNIT-I

1. The foci of an ellipse are 90mm apart and the minor axis is 65mmlong. Draw the ellipse. Draw a tangent to it at a point on it 15mm from major axis.

OR

2. Draw a hypocycloid of a circle of 40mm dia. Which rolls inside another circle of 160mm dia. Draw a tangent to it at a point 65mm from the center of the directing circle?

UNIT-II

3. One end of a line 75mm long is 20mm above H.P. and 25mm in front of V.P. The line is inclined at 30^0 to H.P. and the top view makes an angle of 45^0 with XY. Draw the projections of the line and find its true inclination with V.P.

OR

4. A line AB is 75mm long. A is 50mm in front of V.P. and 15mm above H.P. B is 15mm in front of V.P. Top view of AB is 50mm long. Draw its projections and determine its inclinations with reference planes.

UNIT-III

5. A regular pentagon 50mm side has an edge in the V.P., inclined at 45^0 to H.P. but the surface making an angle of 30^0 with V.P. Draw its projections.

OR

6. Draw the projections of a hexagon of 40mm side with a side parallel to and 20mm above H.P. but inclined at 60^0 to V.P. The surface of the hexagon is inclined at 30^0 to H.P.

UNIT-IV

7. A hexagonal prism, base 35mm side and axis 60mm long is resting on one of its base edges in the H.P., inclined at 30^0 to V.P. and the axis inclined at 45^0 to H.P. Draw its projections.

OR

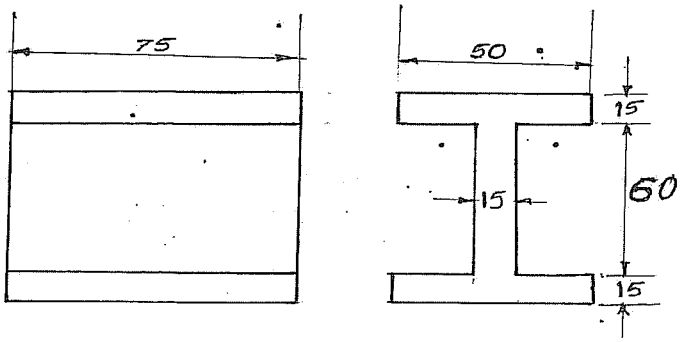
8. Draw the projections of a cone, 50mm base dia and 60mm long axis, having one of its generators in the V.P. inclined at 30^0 to H.P., the apex being in H.P.

UNIT-V

9. Draw the isometric projection of a hexagonal prism, base 30mm long edges & axis 70mm long, the axis being vertical.

OR

10. Draw the isometric view of the solid whose projections are given in the figure:



***

CODE : 4G513 REGULATIONS: R-14

EXAMINATION : B.Tech I Year Supplementary, December-2015

SUBJECT TITLE : Engineering Drawing

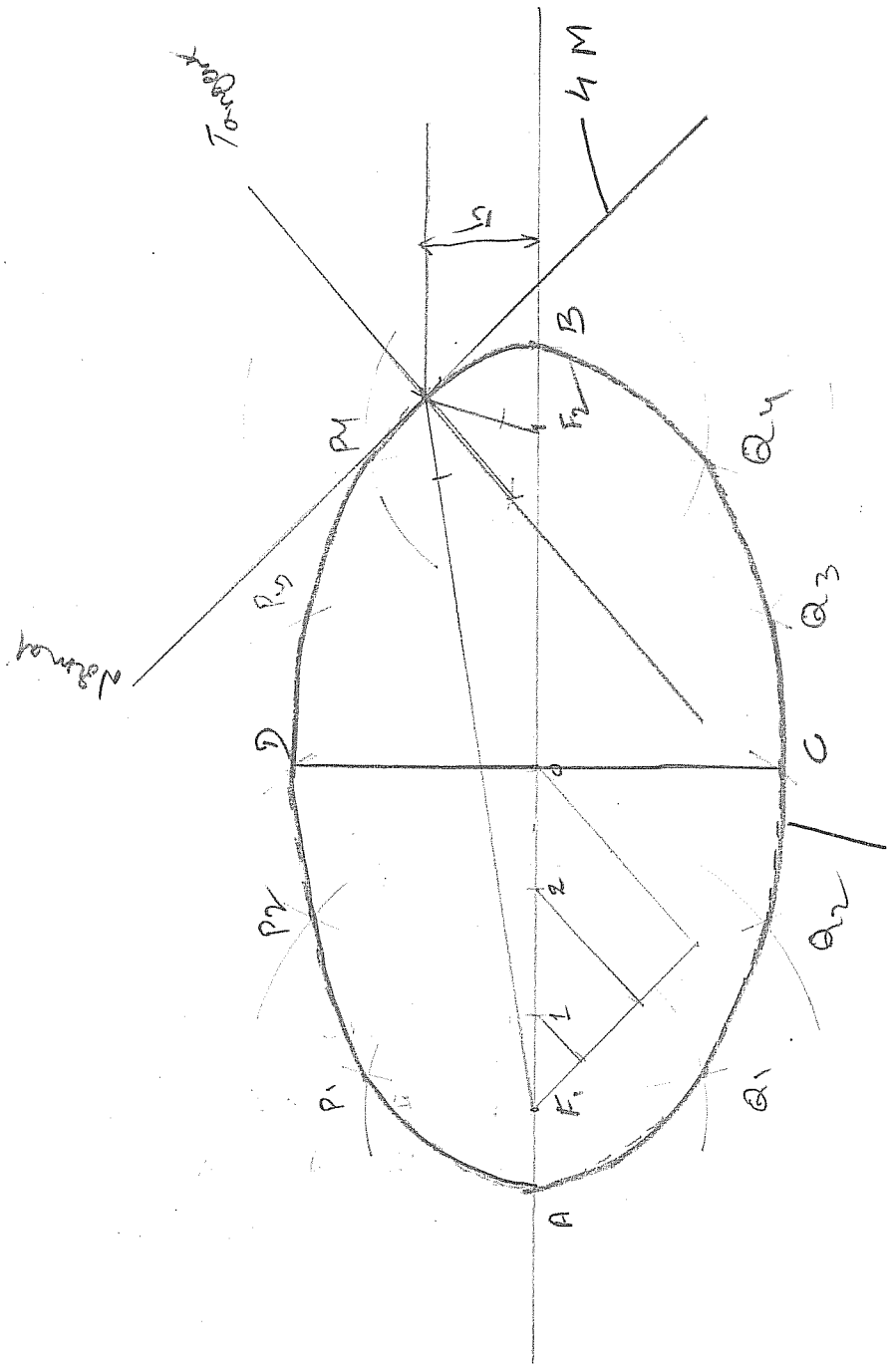
BRANCH : common to EEE, ECE, CSE & IT

1.

$F_1F_2 = 90$

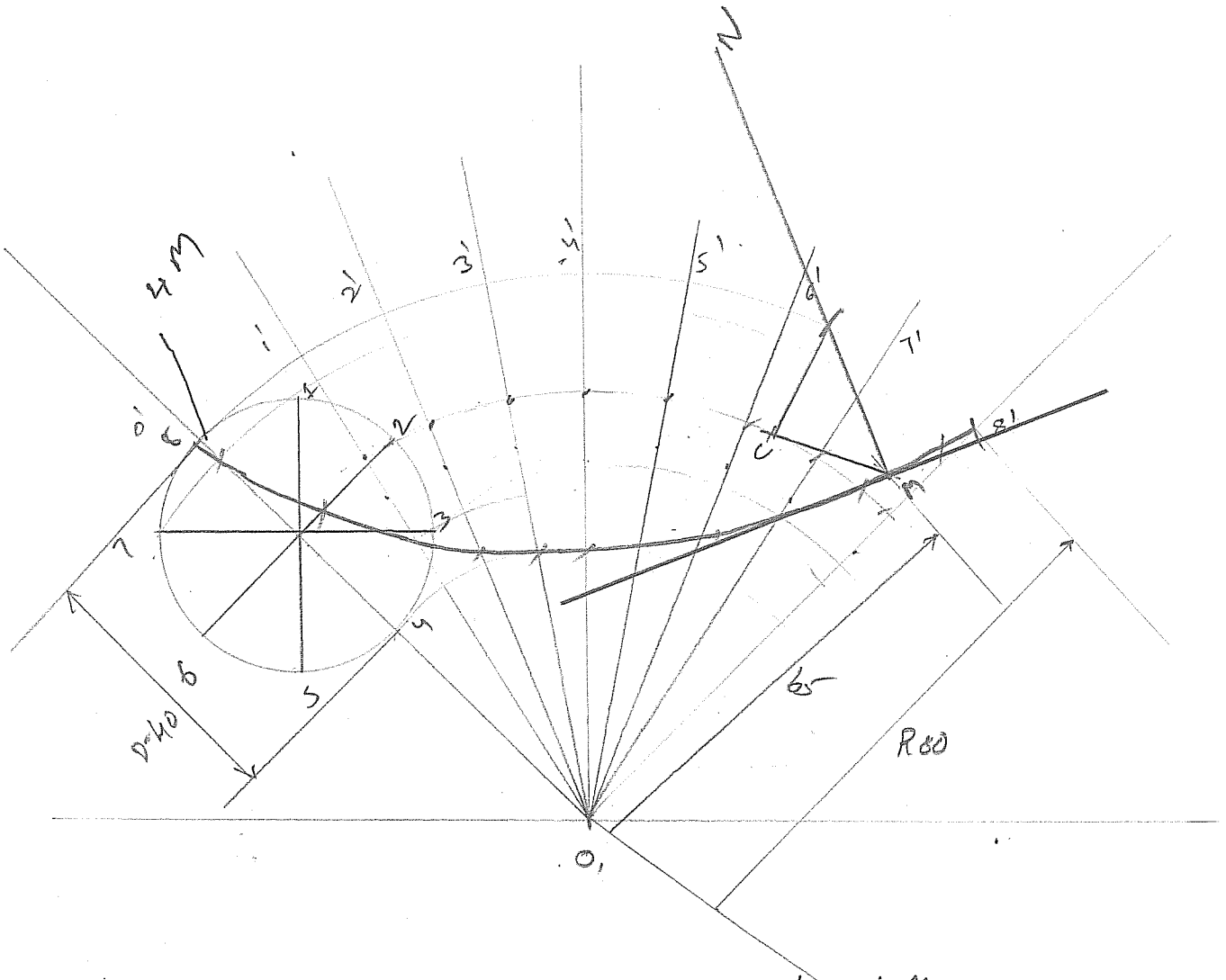
$CD = 65$

$OD = DF_1$



ellipse — 8M
tangent — 4M
diagram — 12 M
dimensions - 2 M
14 M

(2.) $r = 20$. $R = 80$ $\theta = 360 \times \frac{r}{R} = 360 \times \frac{20}{80} = 90°$



circle – 4 M

diagram – 2 M

dimensions – 2 M

θ – 1 M

Link divions – 4 M

tangent & normal – 4 M

(3)

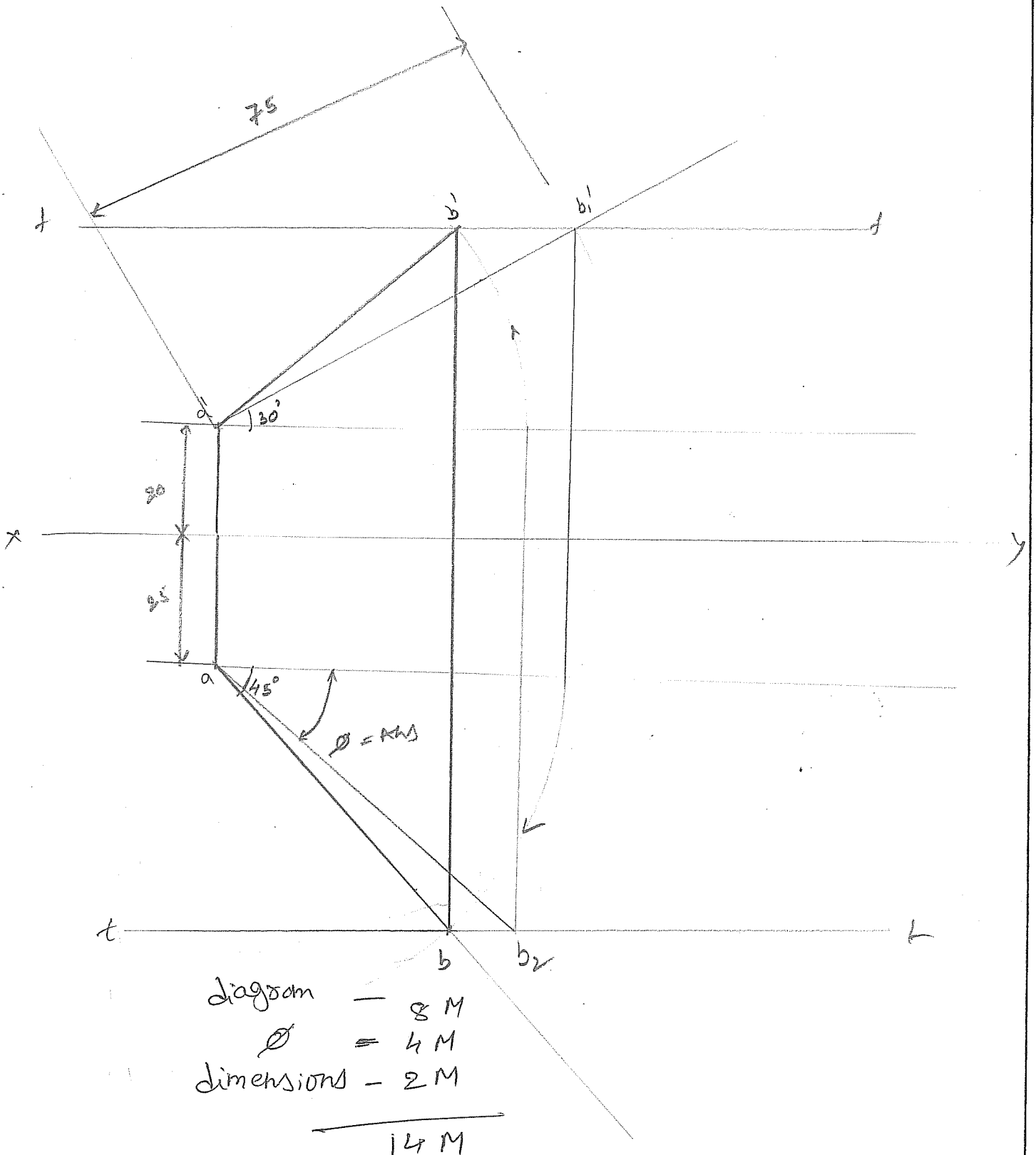


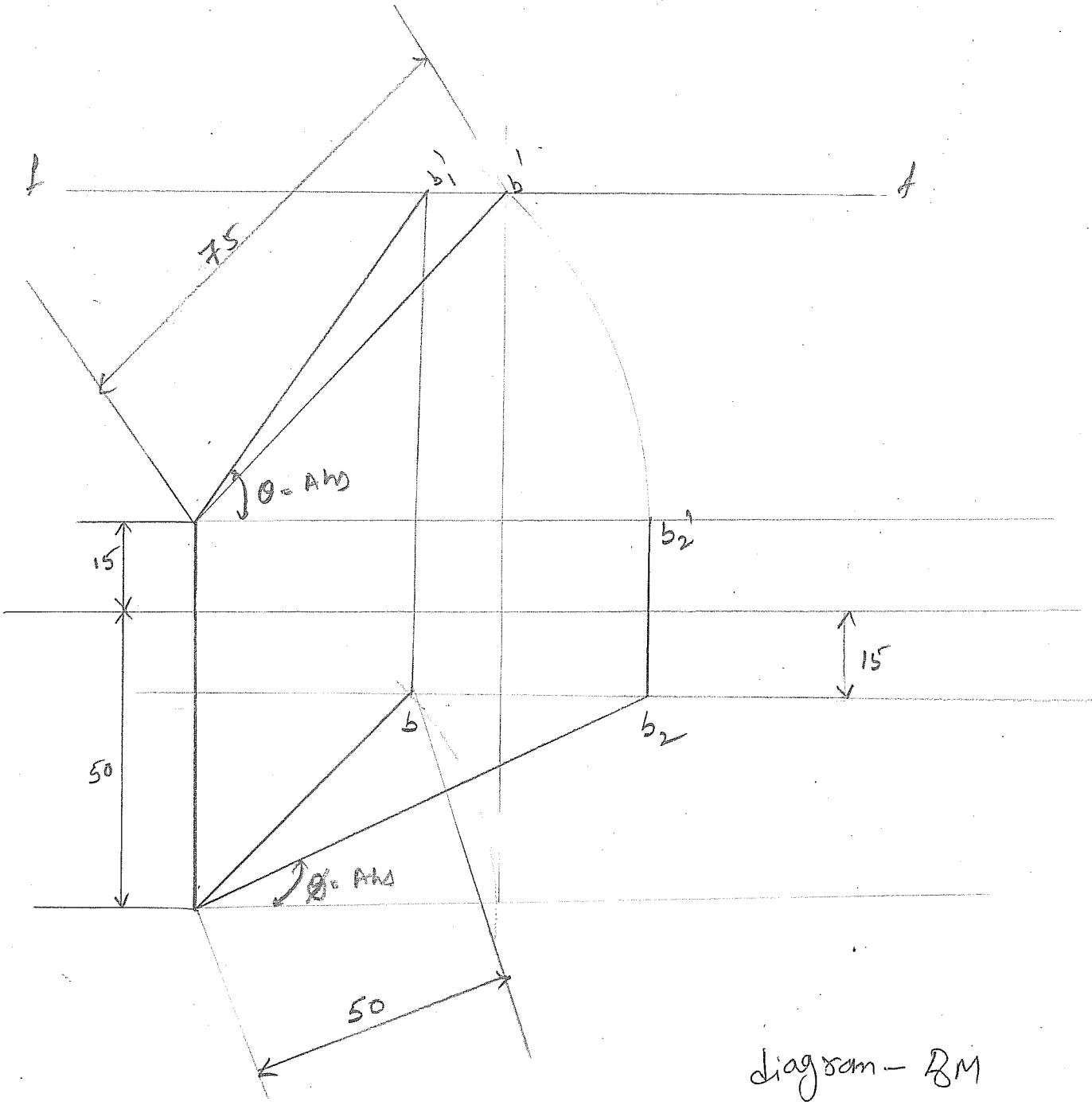
diagram — 8 M

ϕ = 4 M

dimensions — 2 M

14 M

(4)



Inclination with HP = θ = ?

Inclination with VP = Ø = ?

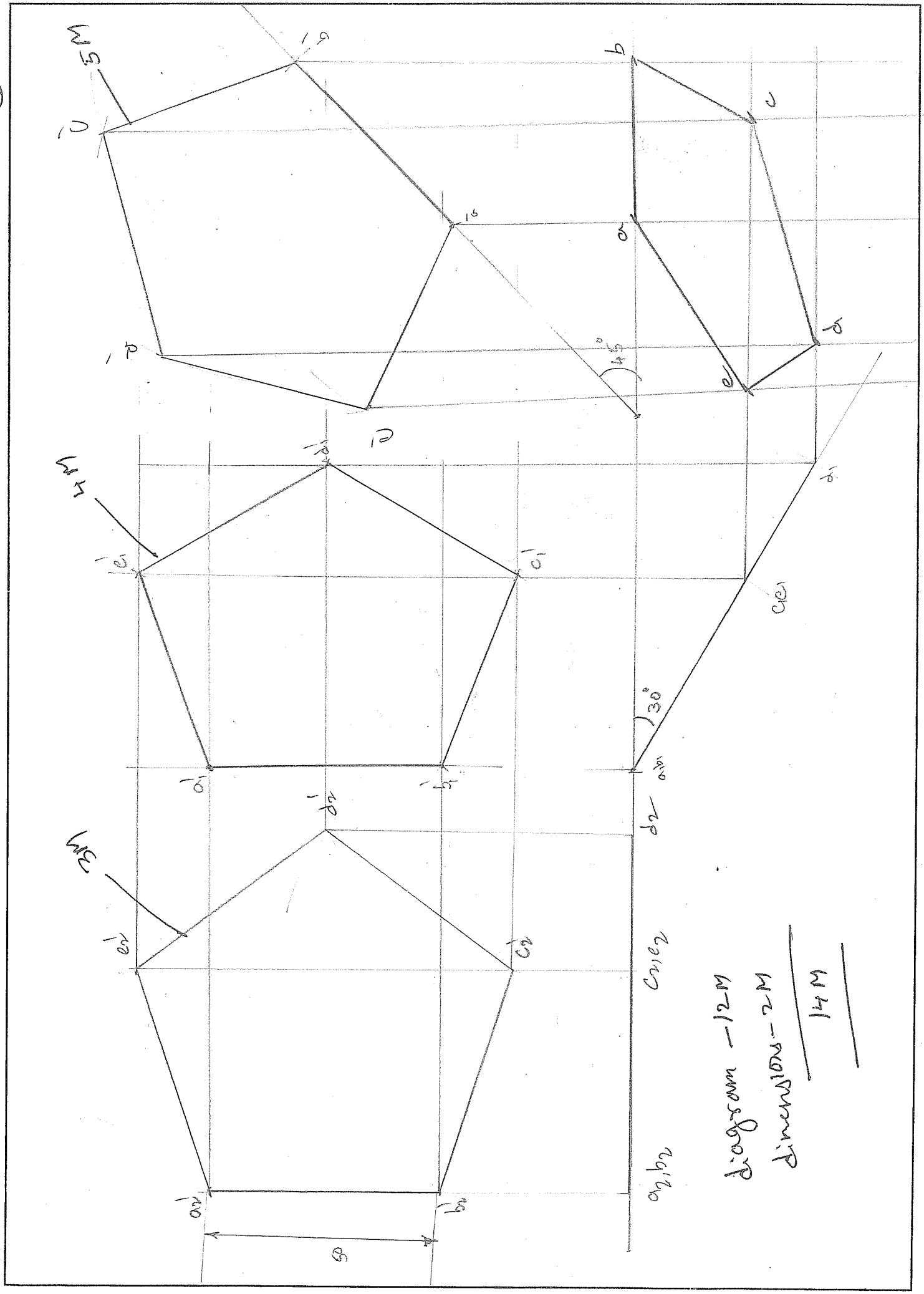
diagram – 8M

θ & Ø – 4M

dimensions – 2M

14 M

(5)



(6)

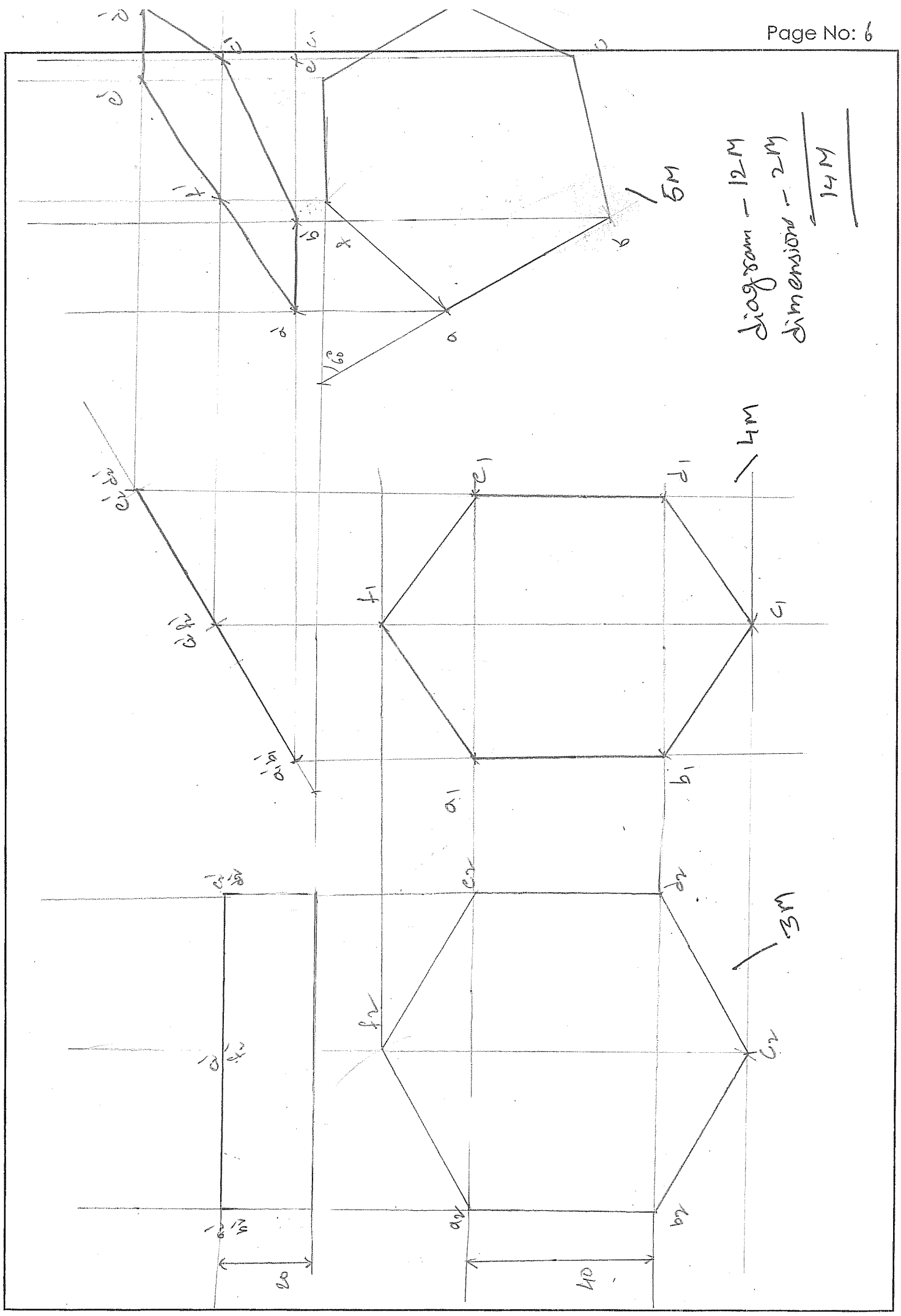


diagram – 12M
dimension – 2M
14M

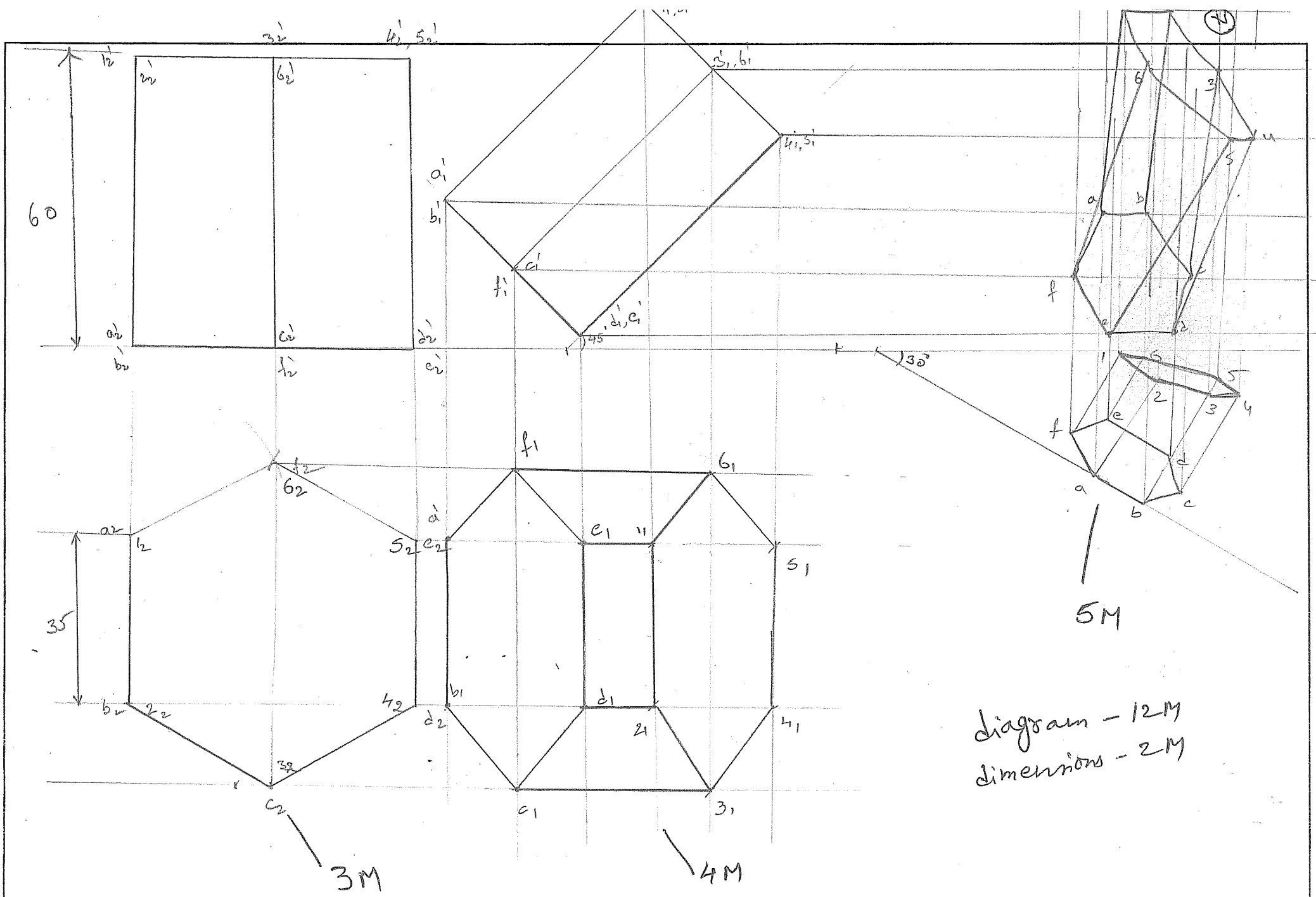
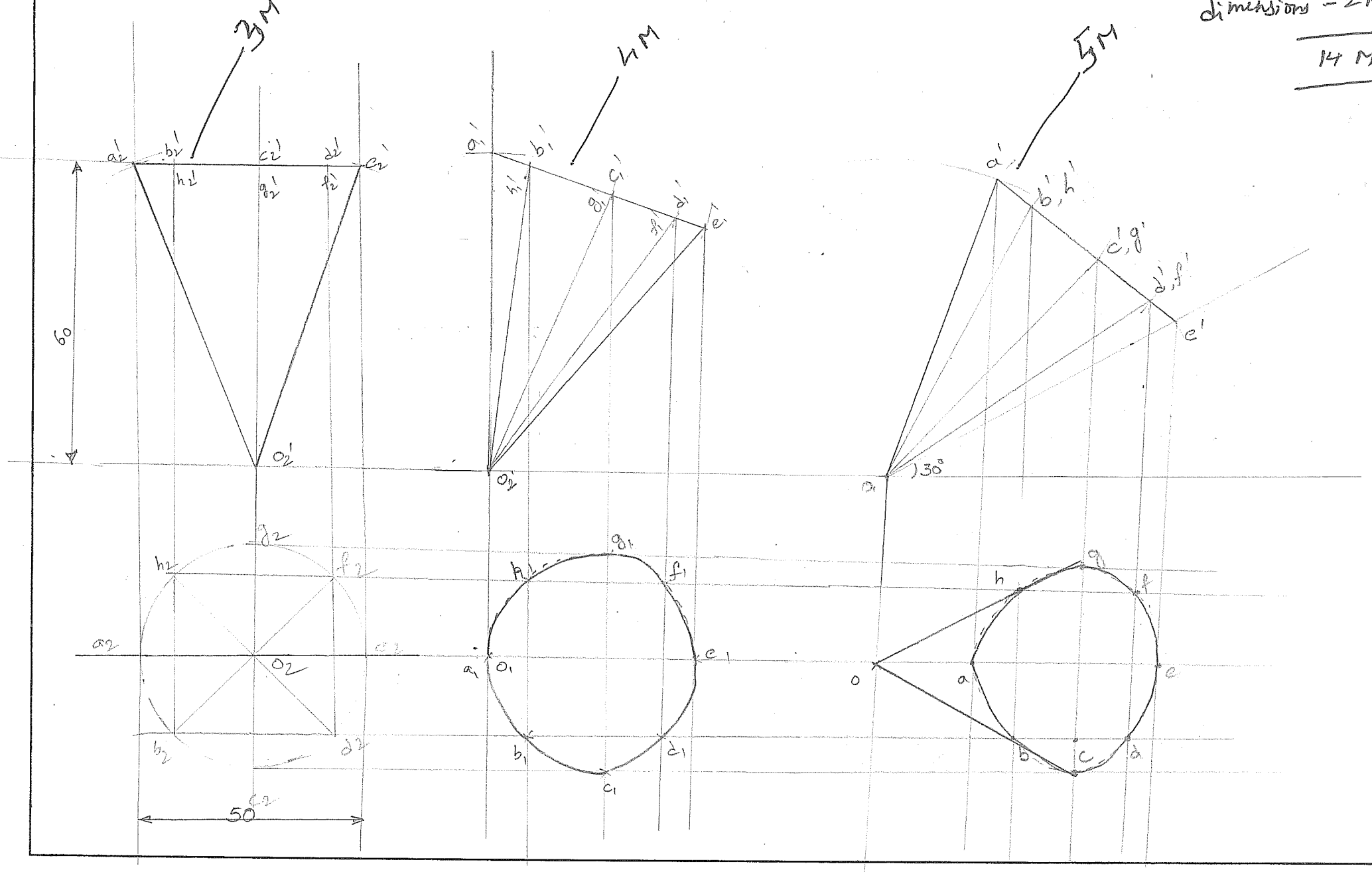

60
35
45°
30°
5M
3M
4M
diagram - 12M
dimensions - 2M

diagram — 12M
dimensions — 2M
14 M

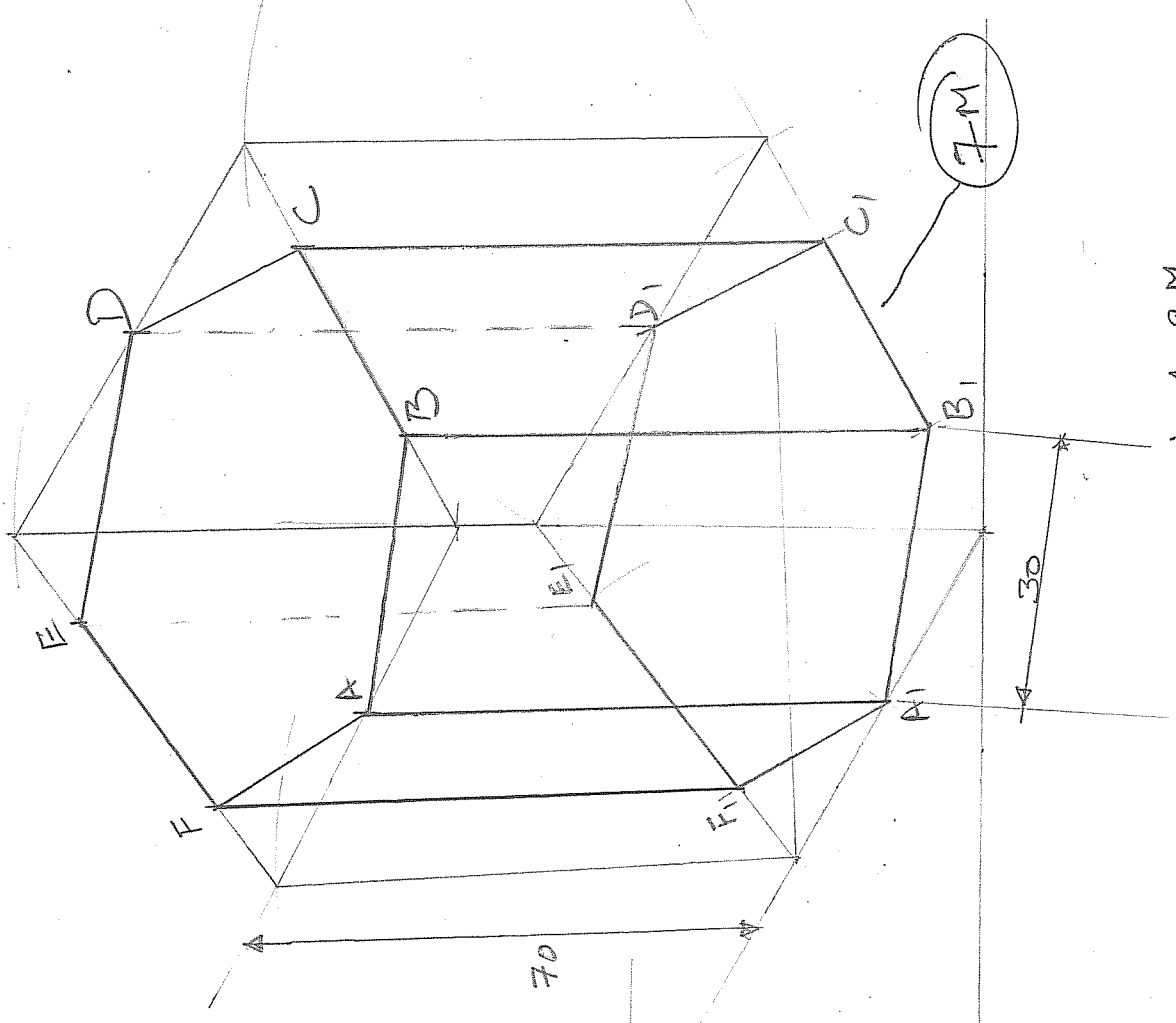
3M

4M

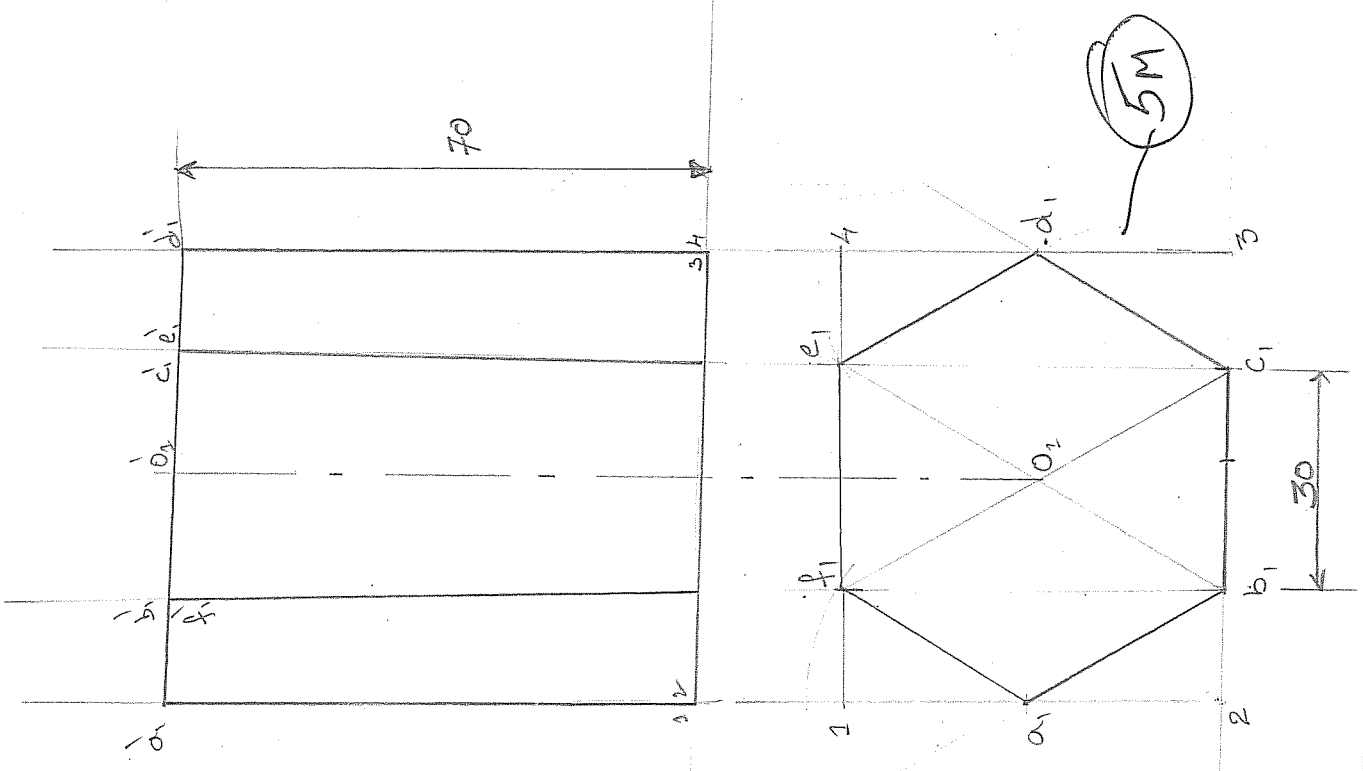
5M



(9)



dimensions 2M
diagram 12M
14M



10

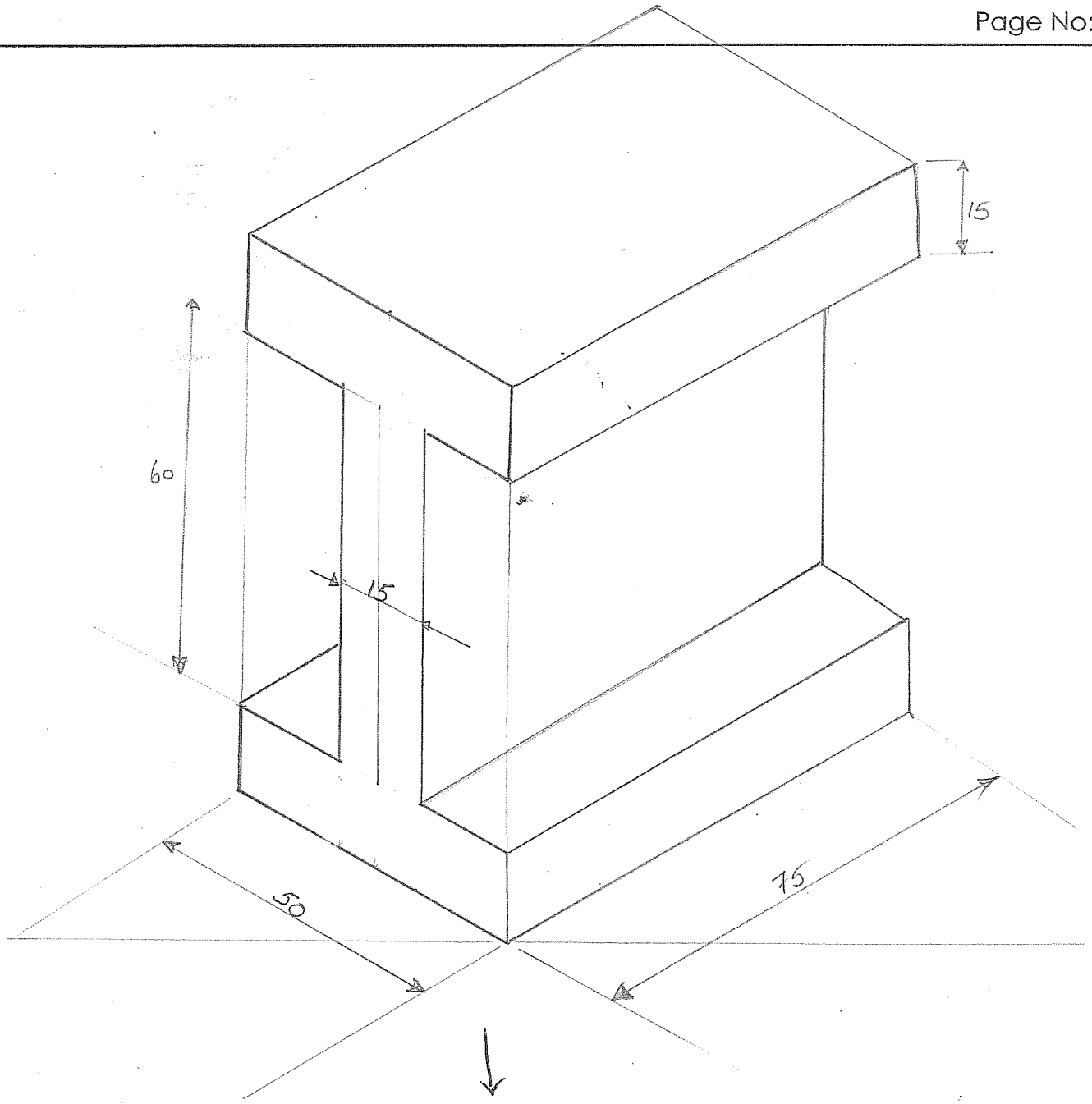


diagram – 12 marks

dimensions – 2 M

14 M

Hall Ticket Number :										

R-14

Code: 4GC12

B. Tech. I Year Supplementary Examinations December 2015

Engineering Physics

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)

****

UNIT-I

1. a) State the necessary conditions for sustained interference. 2M

   b) Write the principle of Newton's rings and obtain an expression for the radius of the nth dark ring of Newton's rings? Explain why the rings are circular and the center is dark in reflected system? 10M

   c) In a Newton's rings experiment the diameter of the 10th ring changes from 1.40 to 1.27 cm when a liquid is introduced between the lense and the glass plate. Calculate the Refractive index of the liquid. 2M

OR

2. a) What do you meant by population inversion and explain how the population inversion achieved in He-Ni laser? 6M

   b) Discuss the industrial and medical applications of lasers. 4M

   c) Explain step and graded index single mode and multi-mode optical fibers in detail. 4M

UNIT-II

3. a) What are the properties of ultrasonics? 3M

   b) What is piezoelectric effect? Discuss the production of ultrasonics by piezoelectric method with a neat diagram. 8M

   c) A quartz crystal of thickness 0.005 m, is vibrating in fundamental mode and produces ultrasonics. If the velocity of ultrasonics in quartz is 5450 m/s, calculate the frequency of ultrasonics. 3M

OR

4. a) What are miller indices? What is their role in crystal structure? 5M

   b) 'Describe Laue's and Powder methods of determination of crystal structure. 6M

   c) Derive Bragg's law of X-ray diffraction. 3M

UNIT-III

5. a) Explain Heisenberg's uncertainty principle. 4M

   b) Derive an expression for the energy level of a particle enclosed in an infinite potential well. 8M

   c) An electron is confined to a box of length 10^{-9} m, calculate the minimum uncertainty in its velocity. Given that m= 9 X 10^{-31} Kg, h= 6.6 X 10^{-34} Joule / Sec 2M

OR

6. a) Using Kronig-Penny model show that the energy spectrum of an electron contains a number of allowed energy bands separated by forbidden bands 7M

   b) On the basis of band theory how the solids are classified into metals, semiconductors and insulators 4M

   c) Explain Fermi-Dirac distribution function. Illustrate the effect of temperature on the distribution 3M

UNIT-IV

7. a) Define the terms
   (i) magnetic permeability
   (ii) magnetic susceptibility
   (iii) magnetic induction and
   (iv) magnetization 6M

   b) Explain the origin of magnetic moment? Find the magnetic dipole moment due to orbital and spin motions of electron. 6M

   c) A para magnetic material has a magnetic field intensity of 10^4 A/m. If the susceptibility of the material at room temperature is 3.7×10^{-3}, calculate the magnetization and magnetic flux density in the material. 2M

OR

8. a) What is the Hall effect? Describe an experimental set-up for the measurement of the Hall coefficient. What are the applications of Hall effect 7M

   b) Explain the construction and working of LED. 7M

UNIT-V

9. a) What is Meissner effect? Explain in detail with neat diagrams. 4M

   b) Describe the differences between type-I and type-II super conductors. 4M

   c) Explain any four applications of superconductors. 6M

OR

10. a) How are optical, thermal, mechanical and magnetic properties of nanoparticles vary with their size? 9M

    b) Describe any three processes by which nano materials are fabricated. 5M

***

Hall Ticket Number :										

Code: 4GC14 **R-14**

B. Tech. I Year Supplementary Examinations December 2015

Mathematics-I

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)

****

UNIT–I

1. a) Solve $\frac{dy}{dx} + x\sin 2y = x^3\cos^2 y$ 6M

   b) Solve $\frac{d^2y}{dx^2} + y = \sec x$ by the method of variation of parameters 8M

OR

2. a) A radioactive substance disintegrates at a rate proportional to its mass. When the mass is 10 mg the rate of disintegration is 0.051 mg per day. How long will it take for the mass of 10 mg to reduce to its half? 7M

   b) Solve $(D^2 - 4D + 1)y = e^{2x}\cos 3x$ 7M

UNIT–II

3. a) Calculate the approximate value of $\sqrt[6]{65}$ using the Lagrange's mean value theorem. 6M

   b) A rectangular box open at the top is to have volume of 32 cubic feet. Find the dimensions of the box requiring least material for its construction. 8M

OR

4. a) Expand $f(x) = \tan x$ using Meclaurin's theorem up to 3rd degree. 6M

   b) Find the shortest and the longest distances from the point (1, 2,-1) to the sphere $x^2+y^2+z^2=24$. 8M

UNIT–III

5. a) Trace the curve $y=x^3$. 6M

   b) Change of order of integration and evaluate $\int_0^{\infty}\int_x^{\infty} \frac{e^{-y}}{y}\,dxdy$. 8M

OR

6. a) Evaluate $\int_0^{\frac{\pi}{4}}\int_0^{a\sin\theta} \frac{r}{\sqrt{a^2-r^2}}\,drd\theta$ 6M

   b) Evaluate $\iiint xyz\,dxdydz$ over the positive octant of the sphere $x^2+y^2+z^2=a^2$. 8M

UNIT–IV

7. a) Evaluate $L\left(\frac{\cos 2t - \cos 3t}{t}\right)$ 6M

b) Using Convolution theorem, evaluate $L^{-1}\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$ 8M

OR

8. Solve $y^{11} + 2y^1 - 3y = \sin t$, $y(0) = 0$, $y^1(0) = 0$, using Laplace transforms. 14M

UNIT–V

9. a) Find the angle between the surfaces $x^2+y^2+z^2=12$ and $x^2+y^2-z=12$ at (2,2,2) 7M

b) Show that the vector $(x^2 - yz)\bar{i} + (y^2 - zx)\bar{j} + (z^2 - xy)\bar{k}$ is irrotational and find it's scalar potential. 7M

OR

10. Verify Green's theorem in the plane for $\int_C [(3x^2 - 8y^2)dx + (4y - 6xy)dy]$, where C encloses the region bounded by $y = \sqrt{x}$ and $y = x^2$. 14M

***

Hall Ticket Number :										

R-14

Code: 4GC15

B. Tech. I Year Supplementary Examinations December 2015

Mathematical Methods

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)

****

UNIT-I

1. a) Define the real matrices and give an example. 4M

   b) Define the rank of the matrix. Find the rank of the matrix A= $\begin{bmatrix} 1 & 1 & 1 & 1 \\ 2 & -2 & 3 & 1 \\ 1 & -1 & 2 & 5 \\ 3 & 1 & 1 & 2 \end{bmatrix}$ by reducing it to Normal form. 10M

OR

2. a) State and prove Caley-Hamilton theorem. 7M

   b) Test for the consistency of the following system of equations and solve if consistent:

   $2x_1 + x_2 + 2x_3 + x_4 = 6, \quad x_1 - x_2 + x_3 + 2x_4 = 6,$

   $4x_1 + 3x_2 + 3x_3 - 3x_4 = -1, \quad 2x_1 + 2x_2 - x_3 + x_4 = 10$ 7M

UNIT-II

3 a) Verify that the sum of the eigen values of A equals the trace of A and their product equals $|A|$, for the matrix $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 3 & -1 \\ 0 & -1 & 3 \end{bmatrix}$ 7M

   b) Reduce the quadratic form $2x_1^2 + x_2^2 + x_3^2 + 2x_1x_2 - 2x_1x_3 - 4x_2x_3$ to the canonical form by orthogonal transformation. Also find the rank, index, signature and the nature of quadratic form. 7M

OR

4. a) Show that A = $\begin{bmatrix} i & 0 & 0 \\ 0 & 0 & i \\ 0 & i & 0 \end{bmatrix}$ is a skew-Hermitian matrix and also unitary. 7M

   b) Verify that the eigen vectors of the real symmetric matrix $A = \begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ are orthogonal in pairs. 7M

UNIT-III

5. a) Find a real root of the equation $x^3 - x - 11 = 0$ by bisection method. 7M

   b) Find a positive root of $Cosx - xe^x$ using Newton-Raphson method. 7M

OR

6. a) Find a real root of $xe^x = 3$ using Regula-Falsi method. 7M

   b) Evaluate $\sqrt{28}$ to four decimal places by Newton-Raphson Method. 7M

UNIT-IV

7. a) Consider the following data for $g(x) = \frac{\sin x}{x^2}$

x	0.1	0.2	0.3	0.4	0.5
$g(x)$	9.9833	4.9696	3.2836	2.4339	1.9177

   Calculate $g(0.25)$ accurately using Newton's forward method of interpolation. 7M

   b) Evaluate $\int_0^2 e^{-x^2} dx$ using Simpon's rule, Taking $h = 0.25$. 7M

OR

8. a) Using Picard method, Solve the IVP $y' = 1 + xy, y(0) = 1$. 7M

   b) Fit a straight line to the given data

X	1	2	3	4	5	6
Y	1200	900	600	200	110	50

   7M

UNIT-V

9. a) Find the Fourier series expansion of $f(x) = \left.\begin{matrix} x, & -® < x < 0 \\ 0, & 0 < x < ® \end{matrix}\right\}$ 7M

   b) Find the half range sine series of $f(x) = 1 + \cos x$ in $(0,®)$ and hence deduce the sum of $1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + ...$ 7M

OR

10. a) Eliminate the arbitrary constants and arbitrary function respectively

    i) $ax^2 + by^2 + z^2 = 1$

    ii) $z = xy + f(x^2 + y^2)$ 7M

    b) Find the complete integral of the first order the differential equation

    i) $pq = 1$

    ii) $z = p^2 - q^2$ 7M

***

Hall Ticket Number :										

R-14

Code: 4G111

B. Tech. I Year Supplementary Examinations December 2015

Programming in C & Datastructures

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)

****

UNIT-I

1. a) What is a high-level programming language? Explain the advantages of high level language compared to assembly language

   b) Define identifiers, keywords, constants, enumerated types and typedef and give example for each one

OR

2. a) Describe the basic steps in software development

   b) Explain the basic computer components.

UNIT-II

3. a) What is an array? Give examples for Single dimension and double dimension arrays. Write a program to read and write data using arrays

   b) Write syntax to *for loop, while loop, do-while loop* and give examples for each. Explain the difference between *while and do-while*

OR

4. a) Explain the string manipulations with examples

   b) Write a program to find the factorial of a given number.

UNIT-III

5. a) Explain the *storage classes* and give an example for each one.

   b) Write syntax for function declaration, definition and calling. Write a program to convert temperature given in degree Celsius to Fahrenheit units *using functions* with parameter passing.

OR

6. a) Write a program to multiply the given two *matrices* using array or points

   b) Explain dynamic memory allocation and de-allocation functions with examples

UNIT-IV

7. a) Define and write the syntax of the structure and union and give example for each one

   b) Write a program for sorting given numbers using bubble sort technique

OR

8. a) What is a FILE? Explain the formatted input and output functions and give examples

   b) Write a program to write data to a file

UNIT-V

9. a) Define Stack data structure. Explain the operations on Stack data structure

   b) Define Queue data structure. Explain the operations on Queue data structure

OR

10 a) What is a singly linked list? Explain the operations on list with routines

   b) Write a program to insert an item in the tree.

***