

--	--	--	--	--	--	--	--	--	--

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

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 $\text{NH}_4\text{Cl} + \text{NH}_4\text{OH}$ 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

Code: 4G511

B. Tech. 1 Year Supplementary Examinations December 2015

Engineering Mechanics

(Common to CE & ME)

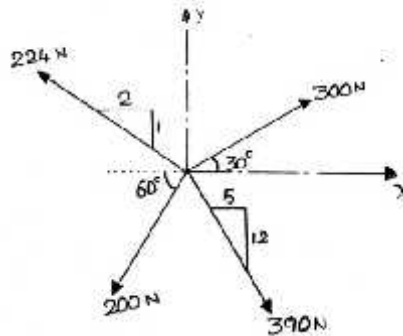
Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. Determine the resultant of the four forces acting on the body shown in figure.



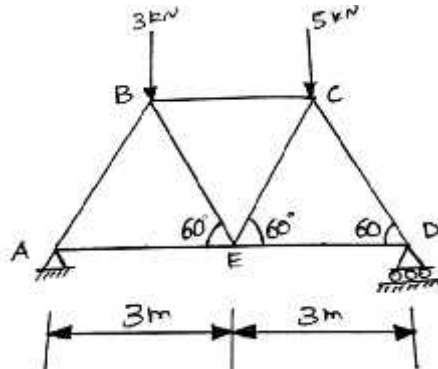
14M

OR

2. a) Define resultant of force, moment of force and couple. 9M
 b) Define system of forces 5M

UNIT-II

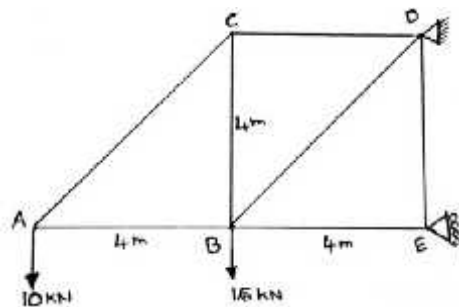
3. Find the forces in all the members of the truss shown in figure by method of joints.



14M

OR

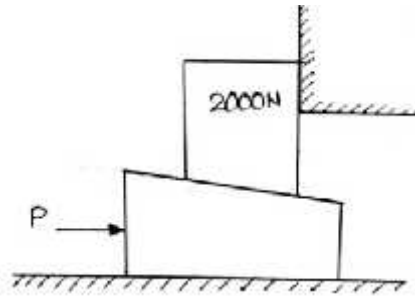
4. Using the method of section, calculate the force in members CD, BD and BE of the truss shown in figure.



14M

UNIT-III

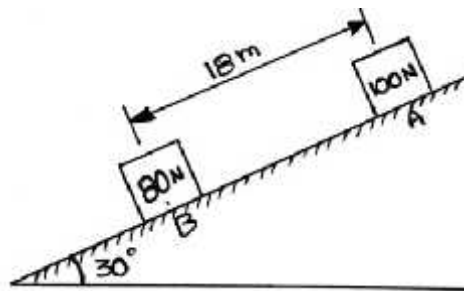
5. Find the least value of horizontal force P to start the wedge towards the right if the angle of the wedge is 15° and $\mu = 1/4$



14M

OR

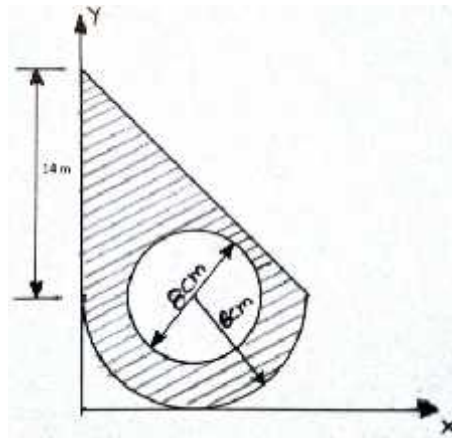
6. Two blocks A & B are released from rest on a 30° incline, when they are 18m apart. The coefficient of friction under the upper block A is 0.2 and that under the lower block B is 0.4. In what time block A reaches the block B? After they touch and move as a single unit, what will be the contact force between them?



14M

UNIT-IV

7. a) Locate the centroid for the shaded area shown in figure.



10M

- b) State and prove parallel axis theorems.

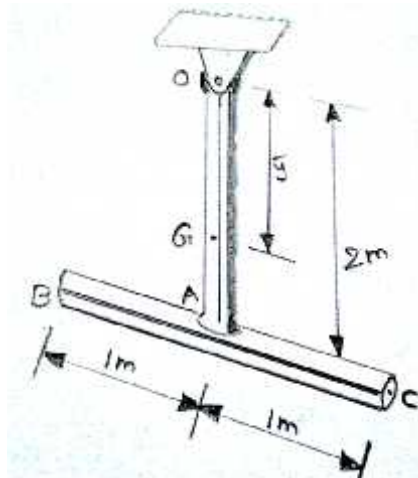
4M

OR

8. The pendulum shown in figure consists of two thin rods of each having a weight of 10 N. Determine the pendulum's mass moment of inertia about an axis passing through

a) The pin at O

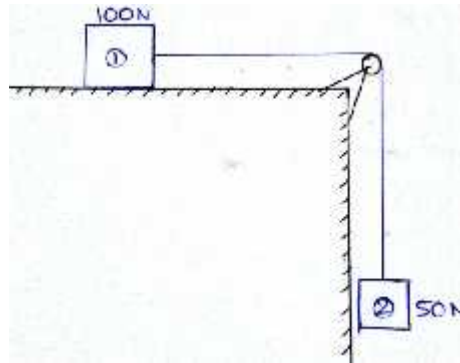
b) the mass center G of the pendulum.



14M

UNIT-V

9. Two blocks of weights 100 N and 50 N are connected by a string as shown in figure. Assuming coefficient of friction between the block 1 and horizontal surface as 0.25 Find the acceleration of the blocks and tension in the string.



14M

OR

10. a) A cricket ball thrown by a fielder from a height of 1.8 m at an angle of 45° to the horizontal with an initial velocity of 20 m/s hits the target at a height of 0.3 m from the ground. How far was the fielder from the wickets? 8M
- b) Distinguish between i) speed and velocity ii) curvilinear and rectilinear motion. 6M

Code: 4G512

B. Tech. I Year Supplementary Examinations December 2015

Engineering Graphics
(Common to CE & ME)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. Construct a parabola with the focus at a distance of 50mm from directrix. Draw a tangent to it, at a point on it 65mm from focus.

OR

2. Inscribe an ellipse in a rectangle of 120 mm & 90 mm sides. Draw a tangent at a point on it 35mm from major axis.

UNIT-II

3. A line AB is inclined at 45° to H.P. The top view of the line measures 60 mm, and is inclined at 45° to XY. The end A is 20mm above H.P. and 20mm in front of V.P. Draw its projections & find its inclination with V.P.

OR

4. A regular hexagon of 35mm side has a side in the H.P. got inclined at 60° to V.P. The surface is inclined at 45° to H.P. Draw its projections.

UNIT-III

5. A square pyramid (base 40mm side & axis 60mm long) has a triangular face in the H.P., the top view of the axis making an angle of 30° with XY. Draw its projections

OR

6. A cylinder of 40mm dia has a circular base in the H.P. it is cut by a section plane, perpendicular to V.P. but inclined to H.P. such that the true shape of the section is an ellipse with major axis 50mm long. Draw the projections and determine the true shape of the section.

UNIT-IV

7. A pentagonal pyramid (base 40 mm side & axis 60mm long) is sectioned by a plane parallel to the base & passing through the mid point of the axis. Develop the lateral surface of the sectioned solid.

OR

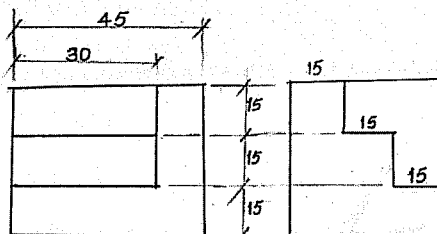
8. A square prism, base 50mm side & axis 70mm long stands on its base in the H.P. with all its vertical surfaces equally inclined to V.P. It is penetrated by a horizontal square prism, base 30mm side, axes bisecting each other. The rectangular surfaces of the horizontal prism are equally inclined to H.P. & V.P. Draw the projection of the solids.

UNIT-V

9. A sphere of 50mm dia. Is centrally placed on the top surface of a vertical square prism, 50mm base side & 60mm long axis. Draw the isometric projection of the combination of solids.

OR

10. Draw the isometric view of the solid shown in the figure.



EXAMINATION: B.Tech. I Year Supplementary Examinations, Dec-2015

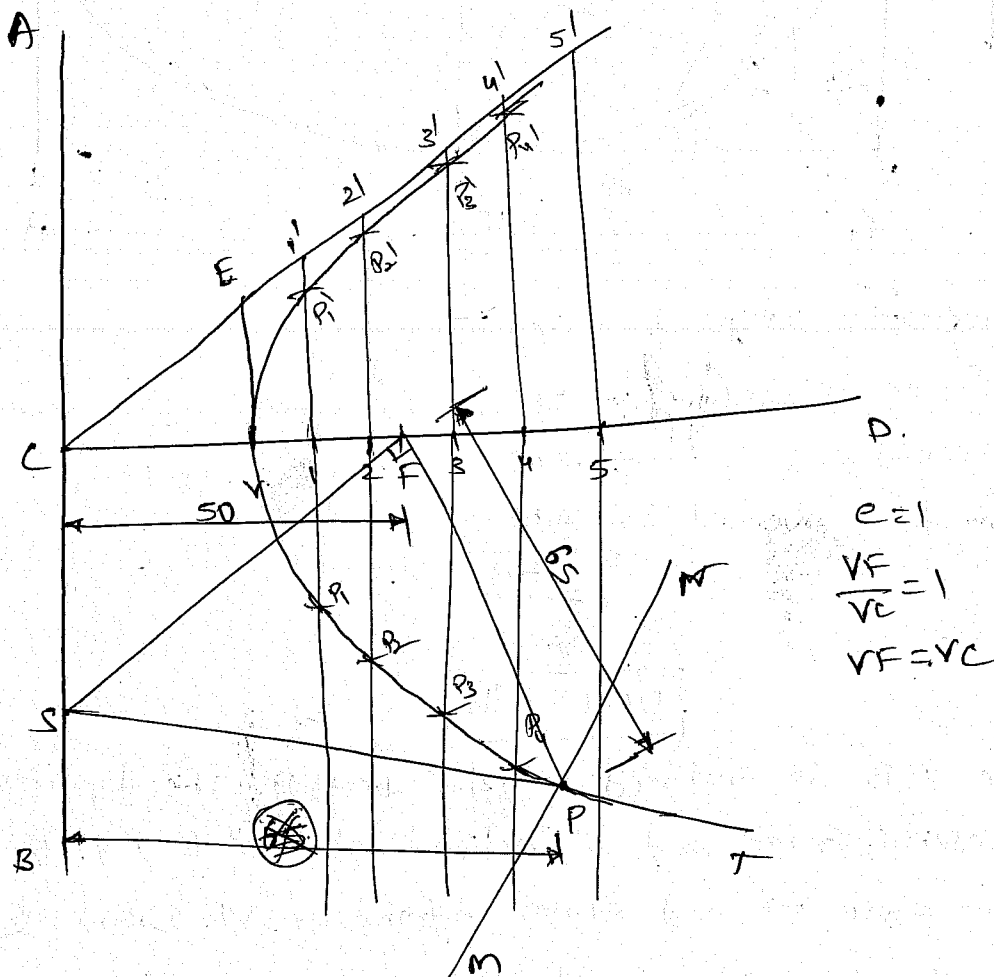
SUBJECT TITLE: Engineering Graphics

BRANCH: Common to ME & CE

UNIT-I

Q1) Construct a Parabola with the focus at a distance of 50mm from directrix. Draw a tangent to it, at a point on it 65mm from focus. (4M)

Solution: General Method :-



$$e = 1$$

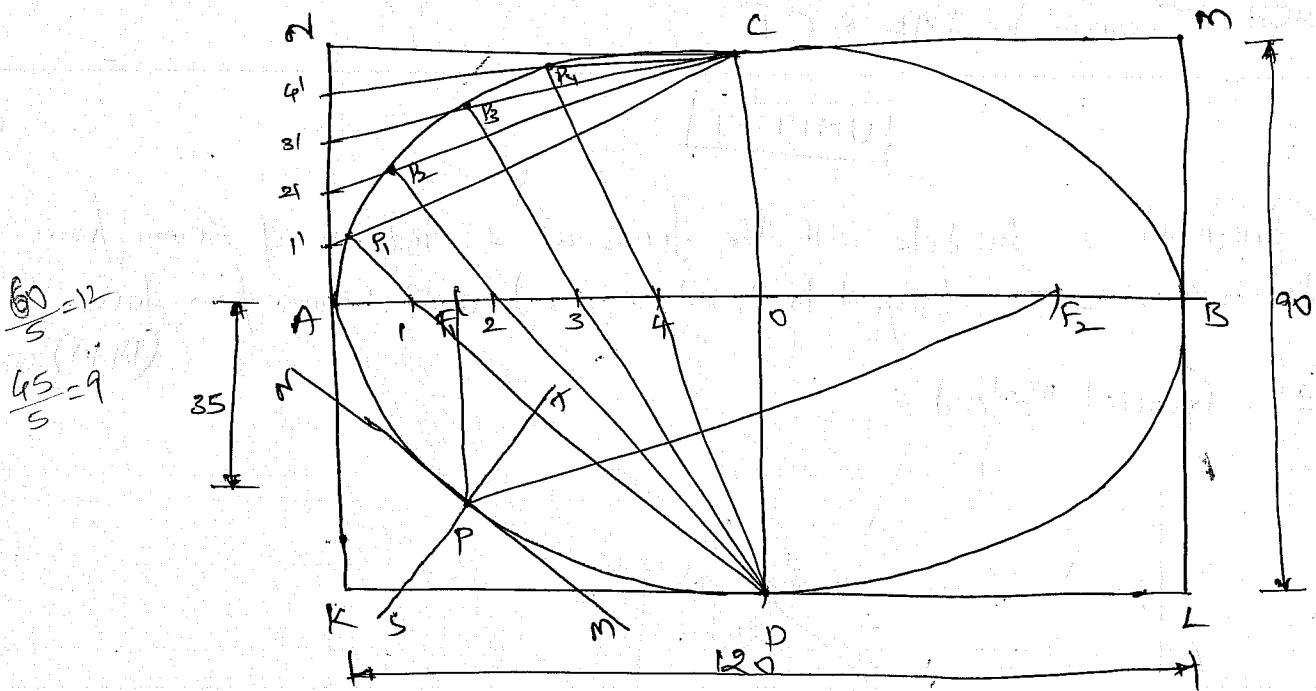
$$\frac{VF}{VC} = 1$$

$$VF = VC$$

- 1) Construction steps - 6M
 - 2) Parabola Curve (smooth) - 2M
 - 3) Dimensions - 2M
 - 4) Tangent & Normal - 4M
-
- 14M

- ② Inscribe an Ellipse in a rectangle of 120 mm & 90 mm sides. Draw a tangent at a point on it 35 mm from major axis. (14M)

Solution



$$\frac{60}{5} = 12$$

$$\frac{45}{5} = 9$$

- 1) Construction steps — 6M
 - 2) Ellipse (Smooth Curve) — 2M
 - 3) Dimensions — 2M
 - 4) Tangent & Normal — 4M
- 14M

UNIT - II

- ③ A line AB is inclined at 45° to HP. The top view of the line measures 60 mm and is inclined at 45° to XY. The end A is 20 mm above HP and 20 mm in front of VP. Draw its projections & find its inclination with VP. (14M)

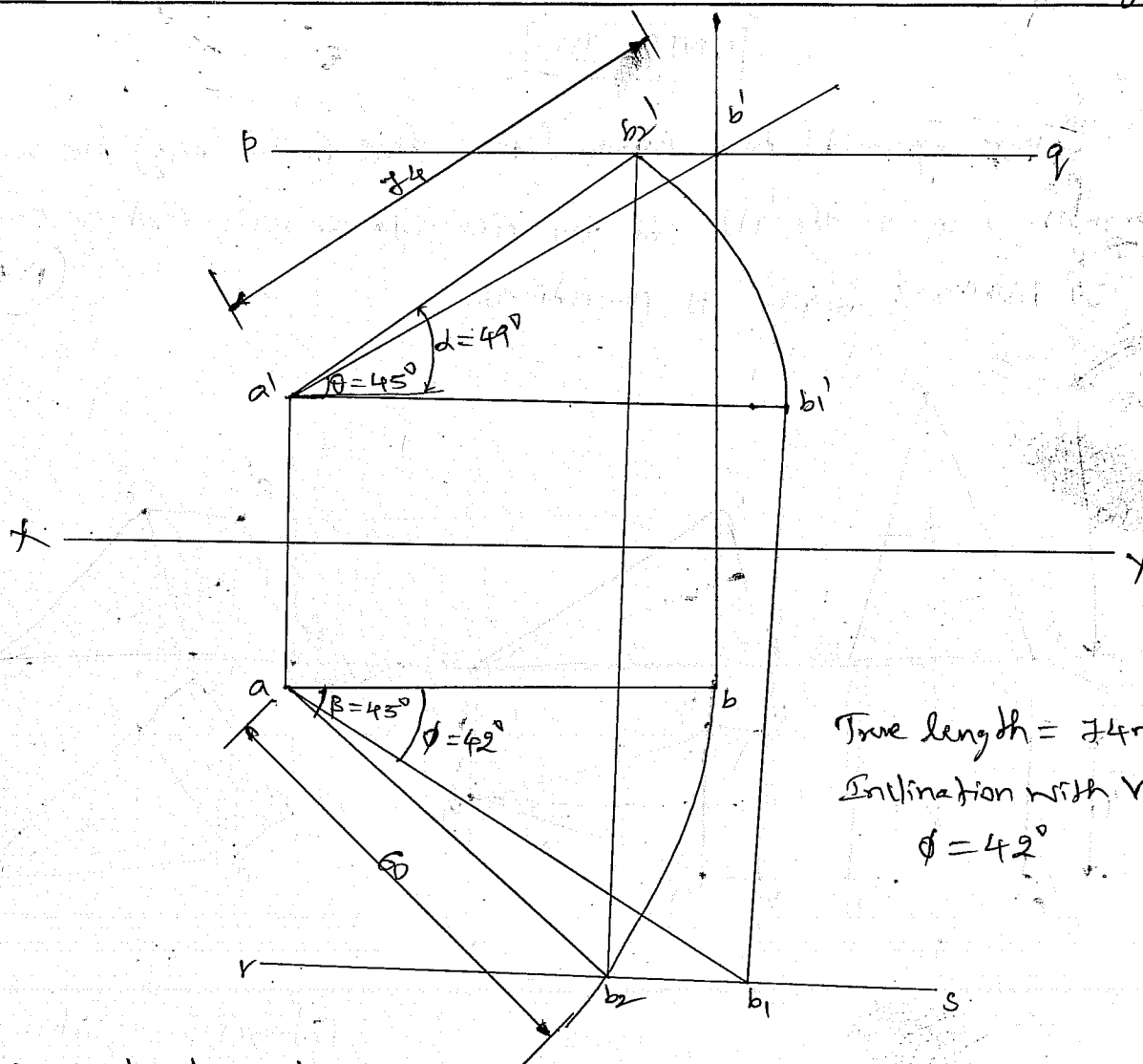
Solution

Line — AB

$$\theta = 45^\circ$$

$$\text{top view length} = 60 \text{ mm}$$

$$\beta = 45^\circ$$

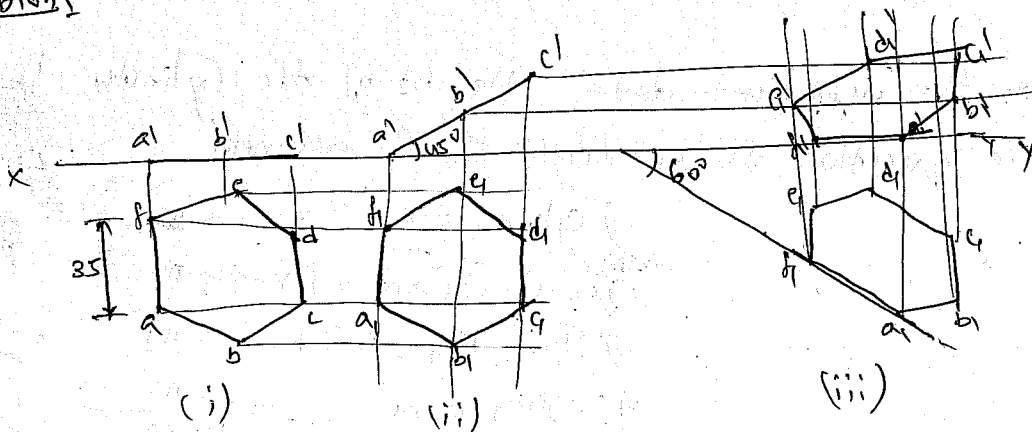


True length = 74mm
 Inclination with VP is $\phi = 42^\circ$

- 1) Construction steps - 5m
 - 2) Projections of line - 5m
 - 3) Dimensions - 2m
 - 4) Inclination with VP - 2m
- 14m

(4) A regular hexagon of 35mm side has a side in the HP got inclined at 60° to VP surface is inclined at 45° to HP. Draw its projections (14m)

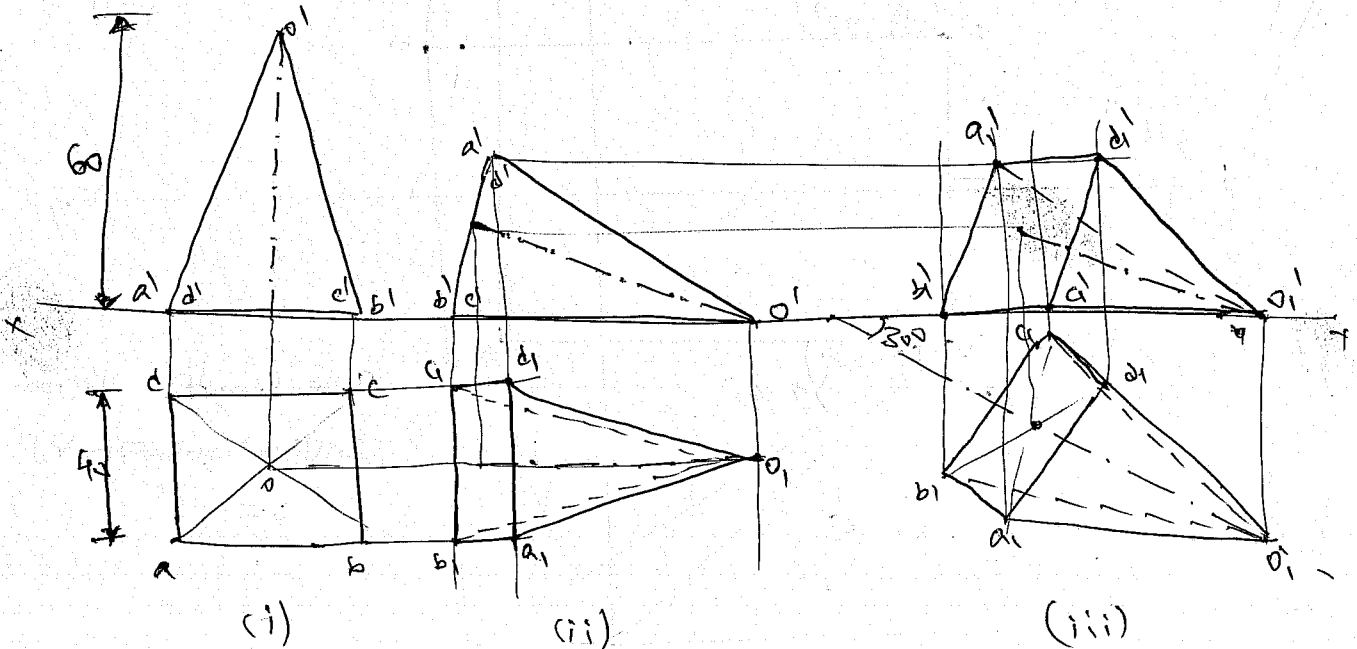
Solution:



- 1) Stage (i) - 3m
 - 2) Stage (ii) - 4m
 - 3) Stage (iii) - 5m
 - 4) Dimensions - 2m
- 14m

UNIT - III

5) A Square pyramid (base 40mm side & axis 60mm long) has a triangular face in the HP, the top view of the axis making an angle of 30° with XY. Draw its projections. (14M)

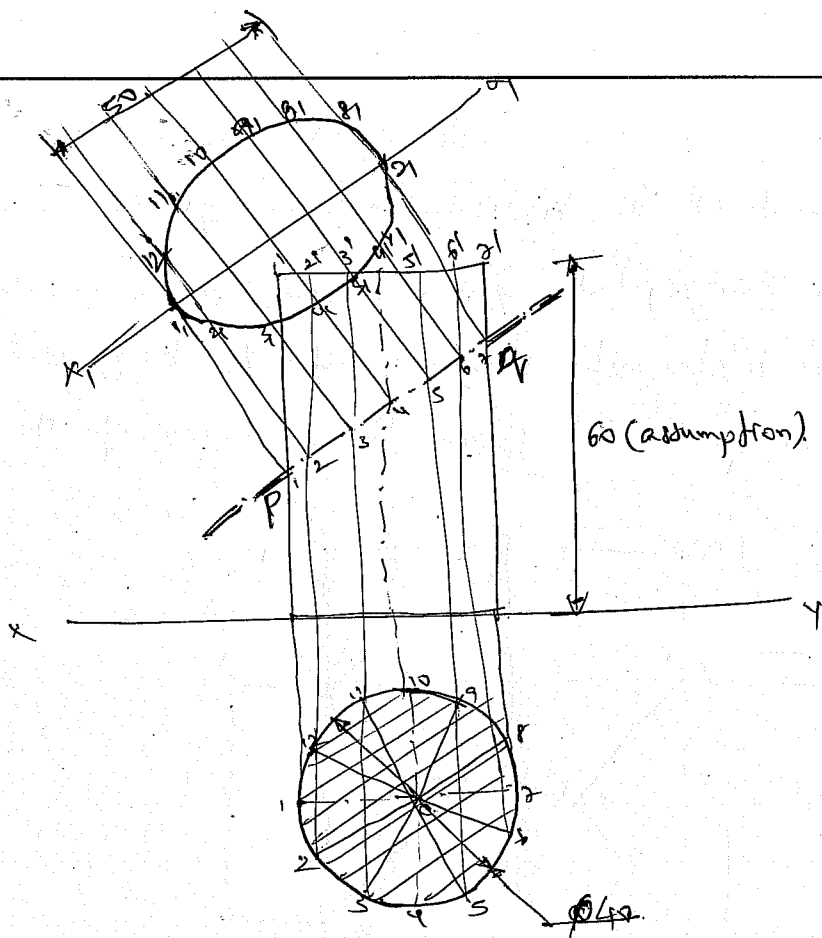


Stage (i)	— 3m
Stage (ii)	— 4m
Stage (iii)	— 5m
Dimensions	— 2m
	14m

6) A Cylinder of 40mm dia has a circular base in the HP it is cut by a section plane, perpendicular to VP but inclined to HP such that the true shape of the section is an ellipse with major axis 50mm long. Draw the projections and determine the true shape of the section. (14M)

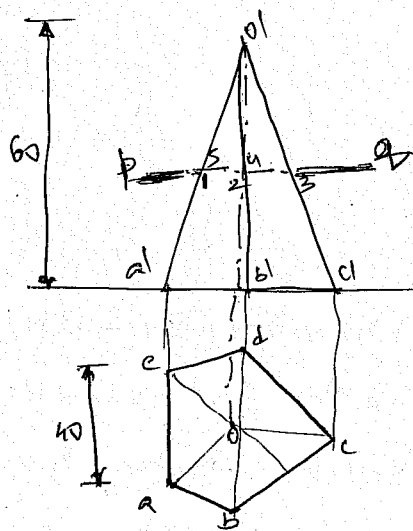
Solution & Note: On sufficient data - Height of the Cylinder is not given in the question, so any height can be assumed.

- 1) Cylinder F.V. & T.V. — 3m
 - 2) Section plane in F.V. — 4m
 - 3) True shape Projection — 5m
 - 4) Dimensions — 2m
- 14M

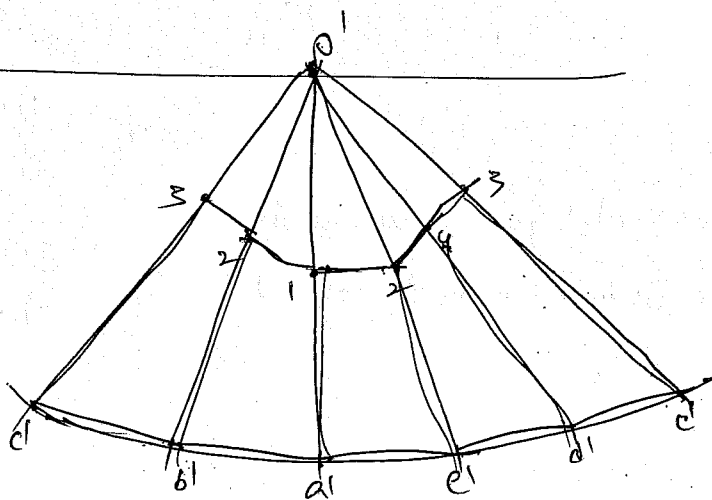


UNIT-IV

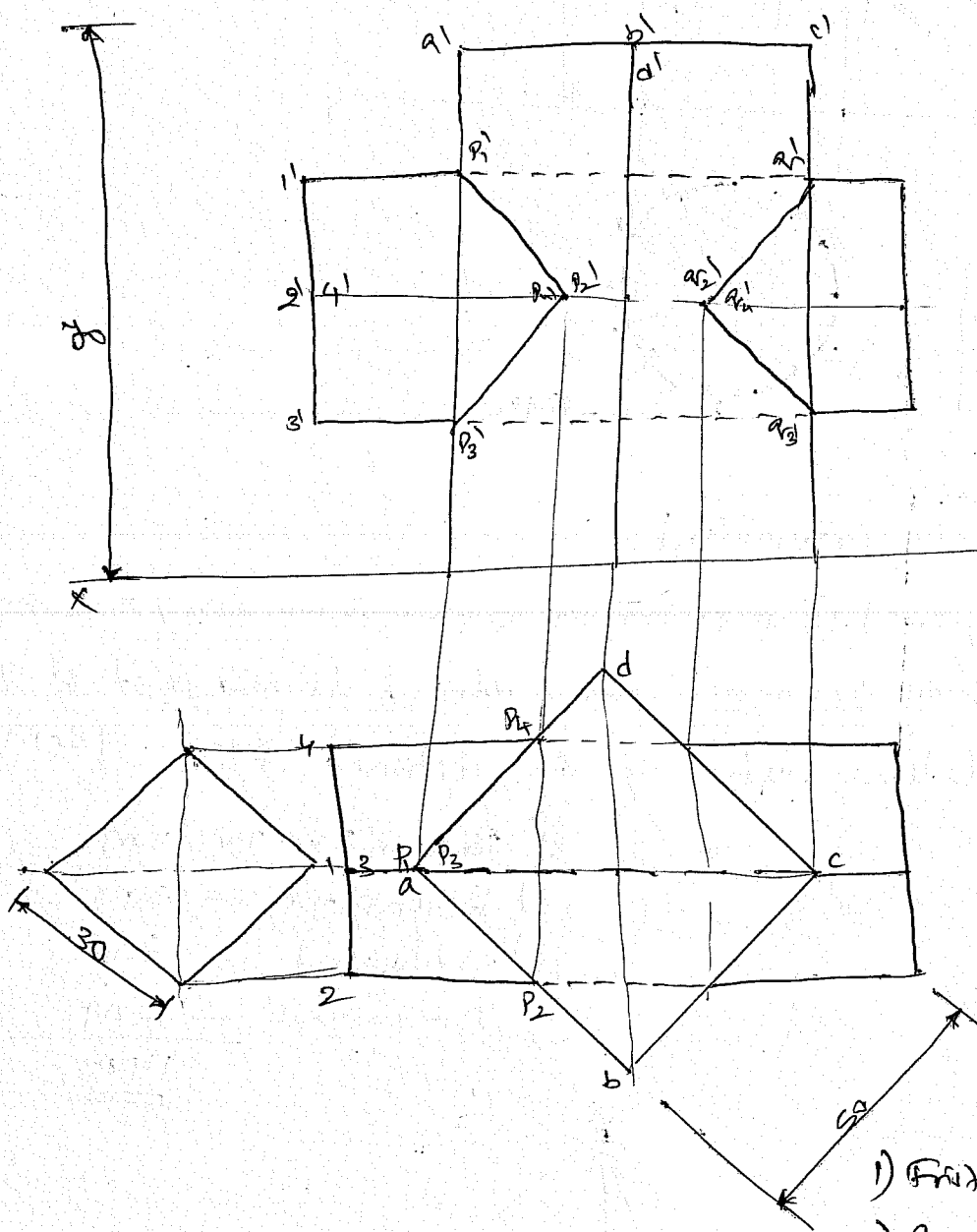
7) A pentagonal pyramid (base 40mm side & axis 60mm long) is sectioned by a plane parallel to the base & passing through the mid point of the axis. Develop the lateral surface of the sectioned solid. (14M)



- | | |
|-----------------------|-----|
| 1) Pentagon Fv & Tv - | 3M |
| 2) Section plane - | 3M |
| 3) Development - | 6M |
| 4) Dimensioned - | 2M |
| | 14M |



8) A Square prism, base 50mm side & axis 70mm long stands on its base in the HP with all its vertical surfaces equally inclined to VP. It is penetrated by a horizontal square prism, base 30mm side axis bisecting each other. The Rectangular surfaces of the horizontal prism are equally inclined to HP & VP. Draw the projection of the solids. (14M)

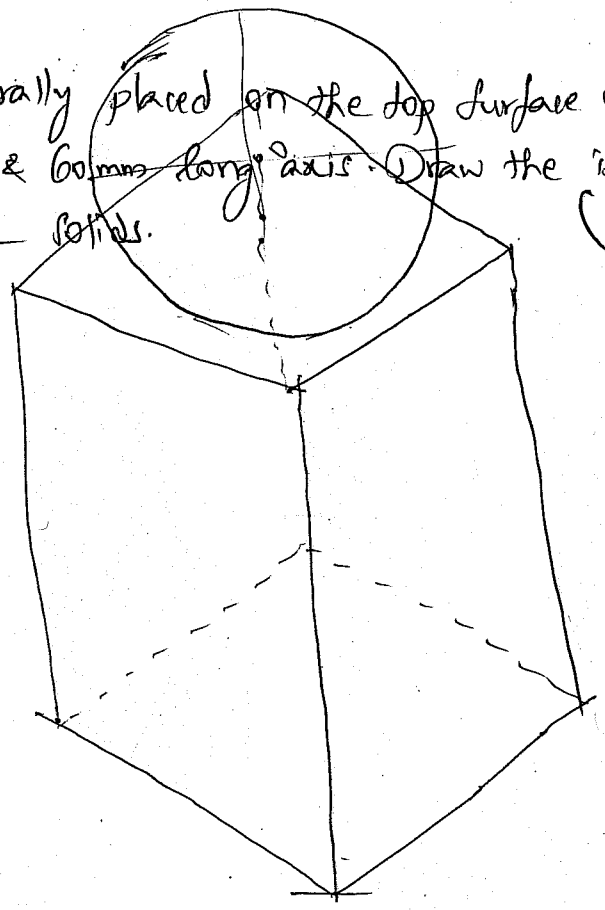
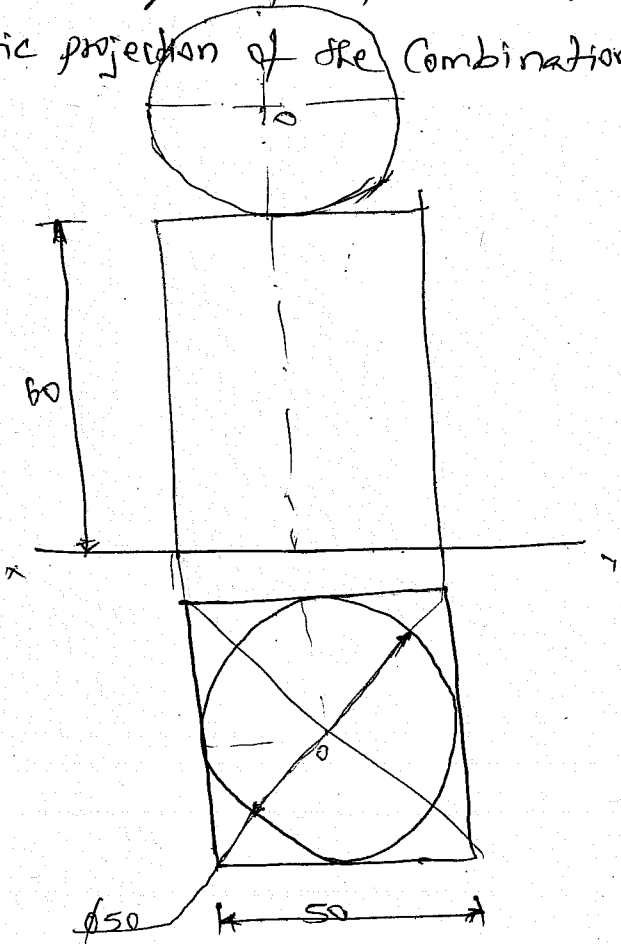


Note: The horizontal prism length is assumed as 70mm. (or any dimension).

- 1) First Prism F.V & T.V - 2M
 - 2) Second Prism F.V & T.V - 2M
 - 3) Intersection Location - 4M
 - 4) Intersection Projection - 4M
 - 5) Dimensions - 2M
-
- 14M

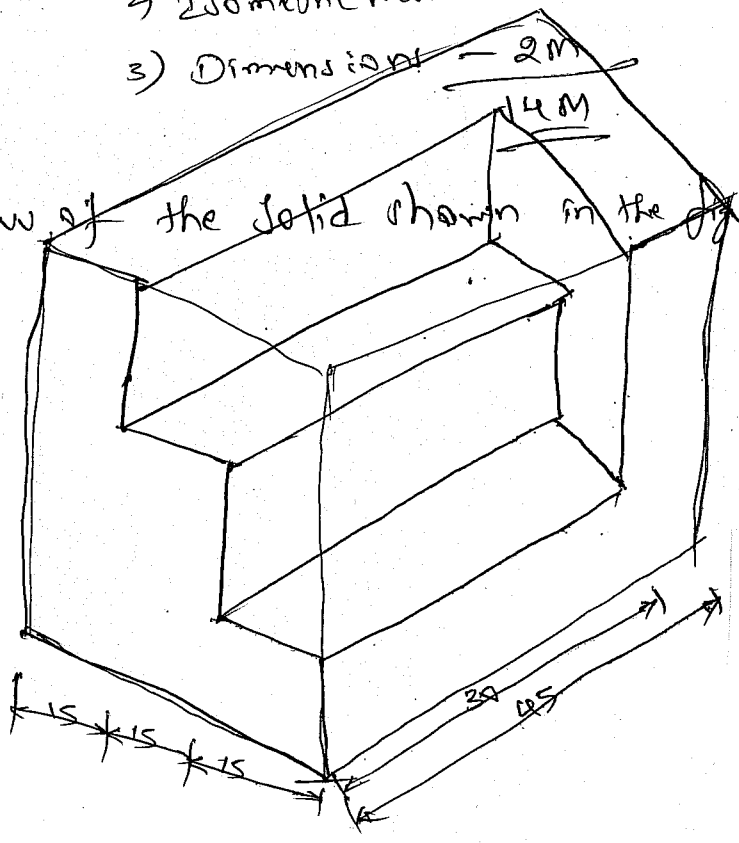
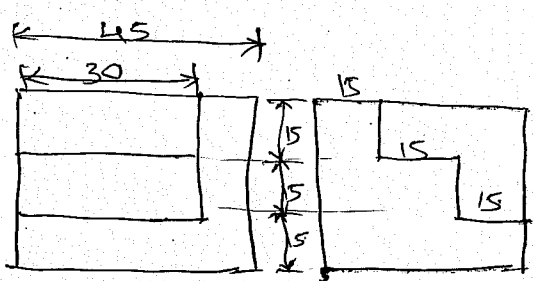
UNIT - V

9) A Sphere of 50mm dia is centrally placed on the top surface of a Vertical Square prism, 50mm base side & 60mm long axis. Draw the isometric projection of the Combination of Solids. (14M)



- 1) F.V & T.V - 4M
- 2) Isometric view - 8M
- 3) Dimensions - 2M

10) Draw the isometric view of the solid shown in the figure



- 1) Out side Length & Breadth - 4M
 - 2) Isometric view - 8M
 - 3) Dimensions - 2M
- 14M

Code: 4GC12*B. Tech. 1 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 $m = 9 \times 10^{-31}$ Kg, $h = 6.6 \times 10^{-34}$ 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 :

--	--	--	--	--	--	--	--	--	--

R-14

Code: 4GC14

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 $\sqrt[3]{65}$ 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 $\int_0^\infty \int_x^\infty \frac{e^{-y}}{y} dx dy$. 8M

OR

6. a) Evaluate $\int_0^{\frac{\pi}{4}} \int_0^{a \sin \theta} \frac{r}{\sqrt{a^2 - r^2}} dr d\theta$ 6M
- b) Evaluate $\iiint xyz dx dy dz$ 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 $y'' + 2y' - 3y = \sin t$, $y(0) = 0$, $y'(0) = 0$, 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 its 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

--	--	--	--	--	--	--	--	--	--	--

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.
