

Hall Ticket Number :																			
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<b>R-11 / R-13</b>
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**Code: 1G112**

B.Tech. I Year Supplementary Examinations December 2017

**C Programming and Introduction to Data Structures**

( Common to CE, EEE, ME & ECE )

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions  
All Questions carry equal marks ( **14 Marks each** )  
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1. a) Explain the history of programming languages.  
b) Write the algorithm for finding maximum of three numbers
  
2. a) Explain the steps involved in creating and executing the c program.  
b) Give the structure of c program.
  
3. a) What is an array? What are the advantages of arrays over ordinary variables?  
b) Write a program to store marks of 100 students in an array and find the average marks of 100 students using array.
  
4. List and explain various string handling functions in C.
  
5. What is Structure? How to pass the member of a structure to a function as an argument. Give an example?
  
6. Write a C program to read name and marks of N number of students from user and store them in a file.
  
7. Write a C program implementing queue using dynamic implementation?
  
8. Define Searching and discuss in details different types of searching techniques with an example.

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**Code: 1G512**

B.Tech. I Year Supplementary Examinations December 2017

**Engineering Graphics**  
( Common to CE & ME )

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions  
All Questions carry equal marks ( **14 Marks each** )  
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1. A wheel of 60mm diameter, rolls downwards on a vertical wall for half revolution and then on the horizontal floor for the remaining half revolution without slipping. Draw the locus of a point on the circumference of the wheel, the initial position of which is the contact point with the wall. Name the curve. 14M
2. A line AB 90mm is inclined at 30° to the H.P. its end A is 12mm above the H.P. and 20mm in front of V.P. its front view measures 65mm draw top view of AB and determine its inclination with the V.P. 14M
3. Draw the projections of a regular hexagon of 25mm side, having one of its sides in the H.P. and inclined at 60° to the V.P. And its surface making an angle of 45° with the H.P. 14M
4. Draw the projection of a pentagonal prism, base 25mm side and axis 50mm long, resting on one its rectangular faces on the H.P. with the axis inclined at 45° to V.P. 14M
5. A cone of base 50mm diameter and 60mm axis is resting on its base on the H.P. A section plane perpendicular to V.P. And inclined at 45° to H.P. bisects the axis of the cone. Draw the development of its lateral surfaces. 14M
6. Figure: 1 shows the Isometric view of the object. Draw the front view, Top view, and side view 14M

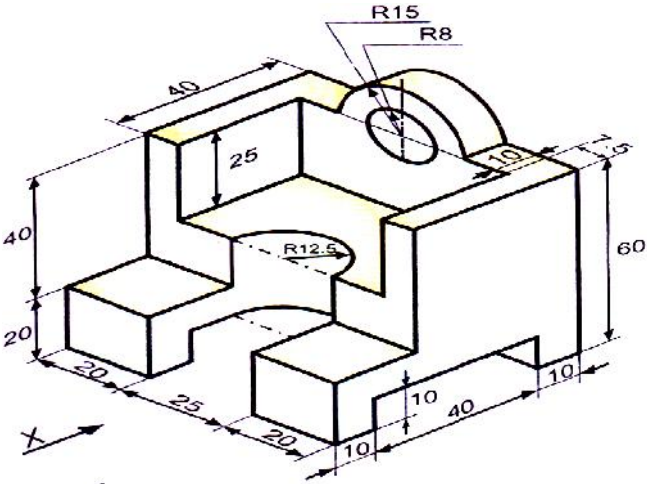


Fig:1

7. A Right circular cylinder of diameter 60 mm and height 90 mm, resting on its base in the HP. It is completely penetrated by another cylinder of diameter 45 mm and 90 mm long, such a way that their axes bisect each other at right angles and parallel to VP. Draw their projections showing curves of intersection. 14M
8. Draw the perspective view of a cube of 25 mm edge, resting on ground plane on one of its faces. It has one of its vertical edges in the picture plane and all its vertical faces are equally inclined to the picture plane. The station point is 55 mm in front of the picture plane, 40 mm above the ground plane and is in a central plane 9 mm to the left of the Centre of the cube. 14M

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**Code: 1G511**

B.Tech. I Year Supplementary Examinations December 2017

**Engineering Mechanics**

( Common to CE & ME )

Max. Marks: 70

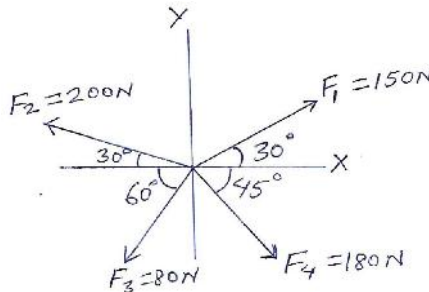
Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks ( **14 Marks each** )

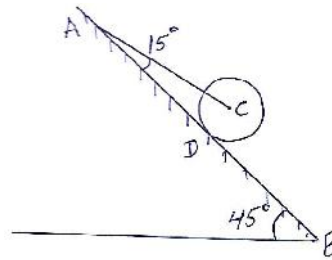
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1. a) Find the resultant of coplanar concurrent forces acting at the point as shown in Figure.



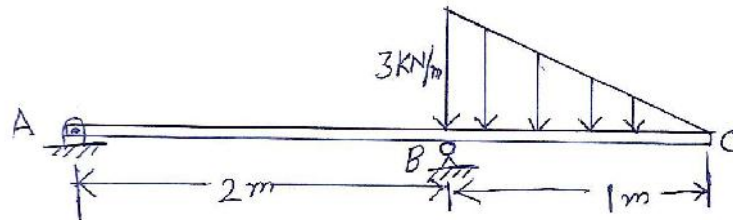
7M

- b) A roller of weight  $W=1000\text{N}$  rests on a smooth inclined plane. It is kept from rolling down the plane by a string AC. Find the tension in the string and reaction at the point of contact D.



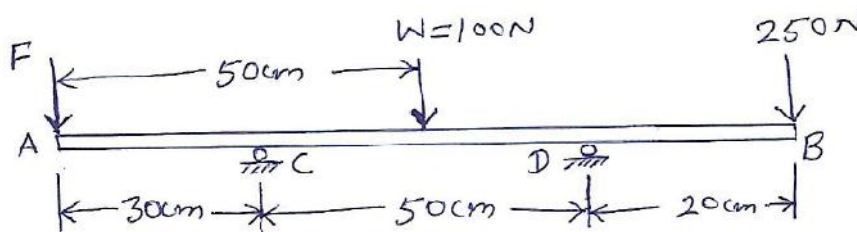
7M

2. a) A beam supports a distributed load as shown in Fig. Determine the reactions at the supports.



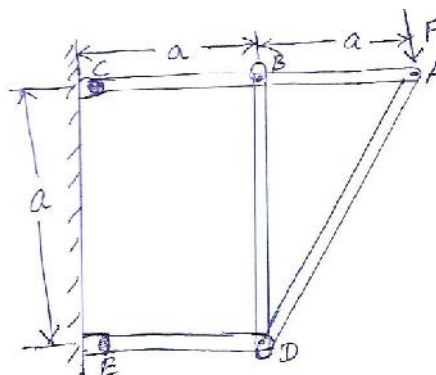
7M

- b) A uniform beam AB of weight  $W=100\text{N}$  rests on two roller supports C and D as shown. If a force of  $250\text{N}$  is applied to the end B, find the range of the values of force  $F$  for which beam will remain in equilibrium.



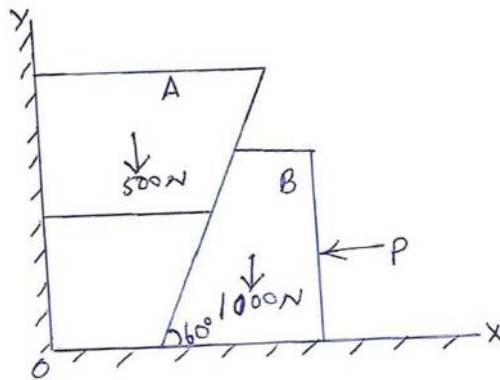
7M

3. For the frame loaded and supported as shown in Fig. Find the axial force in the members BD, AB and ED.



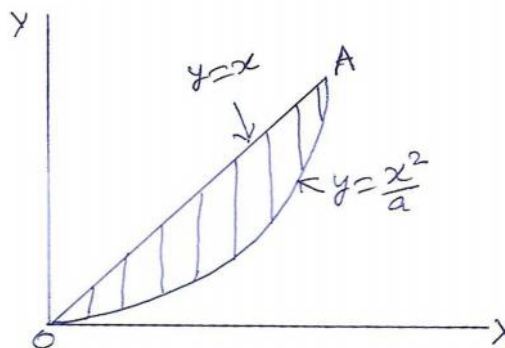
14M

4. Two blocks A and B are resting against a wall and the floor as shown in Fig. Find the value of the horizontal force P applied to the lower block that will hold the system in equilibrium. Coefficient of friction are: 0.25 at the floor, 0.3 at the wall and 0.2 between the blocks.



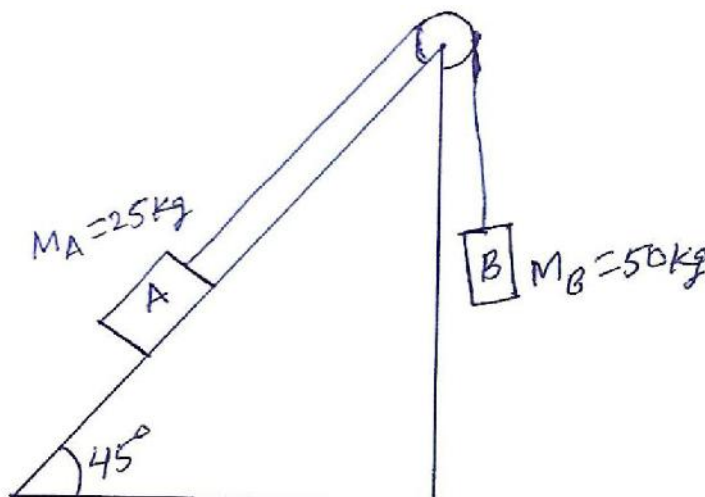
14M

5. Determine the coordinates of the centroid of the shaded area formed by the intersection of a straight line and a parabola as shown in Fig. The equation of the parabola is given by  $y = x^2/a$  and of straight line by  $y = x$ .



14M

6. Derive the mass moment of inertia of sphere about its geometrical axis. 14M
7. Motion of a particle is given by the equation  $x = t^3 - 3t^2 - 9t + 12$ . Determine the time, position and acceleration of the particle when its velocity becomes zero. 14M
8. Mass  $M_A = 25 \text{ Kg}$  rests on a smooth inclined plane of angle  $45^\circ$ . It is connected to another mass  $M_B = 50 \text{ Kg}$  by a string as shown in Fig. If the two masses are released from rest, determine their velocities after the mass  $M_B$  descends a distance of 0.5m.



14M

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Hall Ticket Number : 

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**R-11 / R-13**

**Code: 1GC13**

B.Tech. I Year Supplementary Examinations December 2017

**Engineering Chemistry**

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks ( **14 Marks each** )

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1. a) How are the temporary hardness and permanent hardness of water determined? 7M  
b) What is desalination? Mention some methods available for desalination. With a neat diagram explain desalination by reverse osmosis. 7M
2. a) Explain acid-base titration conduct metrically. 7M  
b) Explain the construction and working of H<sub>2</sub>-O<sub>2</sub> fuel cells. 7M
3. a) Explain the mechanism of chemical and electrochemical corrosion. 7M  
b) What is sacrificial anode? Mention its role in the prevention of corrosion. 7M
4. a) Describe the free radical mechanism of addition polymerization with a suitable example. 7M  
b) Describe the preparation, properties and uses of following polymers.  
(i) Bakelite,  
(ii) Teflon. 7M
5. a) Explain the classification of explosive.  
(i) Primary or initiating explosives,  
(ii) Low explosives or propellants. 7M  
b) Explain the following properties of lubricants.  
(i) Flash and Fire points,  
(ii) Cloud and Pour points. 7M
6. a) What is phase rule? Explain the various terms involved in it. 6M  
b) With a neat diagram explain lead- silver system. 8M
7. a) Describe the Otto-Hoffman method of coke manufacture and the recovery of various by product. 7M  
b) Explain Orsat method of flue gas analysis. 7M
8. a) Write notes on  
(i) White cement  
(ii) Water proof cement 8M  
b) What are the characteristics of a good refractory? Write a note on carborundum. 6M

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Hall Ticket Number :

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**R-11 / R-13**

**Code: 1GC12**

B.Tech. I Year Supplementary Examinations December 2017

**Engineering Physics**  
(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks ( **14 Marks each** )

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1. a) Explain interference in thin films by reflected light. 3M  
b) Explain an experimental method of determination of wavelength of spectral lines of a given source of monochromatic light using plane diffraction grating. 7M  
c) Explain construction and working of a Nicol prism with neat diagram. 4M
2. a) What are Miller Indices? Explain the steps involved in calculation of it with an example. 4M  
b) With a neat sketch, explain the Powder method to determine the crystal structure. 6M  
c) Derive an expression for interplanar spacing in orthogonal system. 4M
3. a) Derive time-independent Schrodinger's wave equation. 6M  
b) Give the classification of solids into conductors, semiconductors and insulators on the basis of band theory of solids. 4M  
c) An electron is bound in one-dimensional box of size  $4 \times 10^{-10}$  m. Find the minimum energy, second and third existed states? 4M
4. a) Explain how a PN junction diode acts as a Light Emitting Diode. 4M  
b) What is Hall effect? Derive an expression for Hall coefficient for n-type semiconductor. Mention its applications. 7M  
c) Differentiate direct and indirect band gap semiconductors with examples. 3M
5. a) What are soft and hard magnetic materials? Give their characteristic properties and applications. 4M  
b) Describe Lorentz method to calculate the local field in dielectrics. 7M  
c) Write short note on Ferroelectric materials. 3M
6. a) What are Type-I and Type-II superconductors? Explain. 4M  
b) With neat diagrams, describe the construction and working of Ruby laser. 6M  
c) Mention applications LASERS in industry and Medical field. 4M
7. a) Derive the expression for acceptance angle and Numerical Aperture of an Optical fibre 5M  
b) Derive the expression for acceptance angle and Numerical Aperture of an Optical fibre 5M  
c) Draw the block diagram of optical fibre communication system and explain the function of each block. 4M
8. a) In detail explain one of the method of fabrication of Nanomaterials. 5M  
b) Discuss about surface to volume ratio and quantum confinement. 4M  
c) Mention applications of carbon nanotubes and nanomaterials. 5M

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Code: 1GC14

B.Tech. I Year Supplementary Examinations December 2017

**Mathematics-I**

( Common to all branches )

Max. Marks: 70

Time: 3 Hours

Answer any **five** questionsAll Questions carry equal marks ( **14 Marks each** )

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1. a) Solve  $\cos^2 x \frac{dy}{dx} + y = \tan x$  4M
- b) Find the orthogonal trajectories of the family of cardioids  $r = a(1 - \cos \theta)$  where  $a$  is the parameter. 5M
- c) A body originally at  $80^\circ C$  cools down to  $60^\circ C$  in 20 minutes, the temperature of the air being  $40^\circ C$ . What will be the temperature of the body after 40 minutes from the original? 5M
2. a) Solve  $\frac{d^2 y}{dx^2} - 6 \frac{dy}{dx} + 9y = 6e^{3x} + 7e^{-2x} - \log 2$ . 7M
- b) Solve by the method of variation of parameters  $\frac{d^2 y}{dx^2} + y = \operatorname{Cosec} x$  7M
3. a) Verify Rolle's Theorem for  $f(x) = x(x+3)e^{-\frac{x}{2}}$  in  $[-3, 0]$  7M
- b) Find the maximum and minimum values of  $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$ . 7M
4. a) Trace the curve  $y^2(a-x) = x^2(a+x)$  7M
- b) The part of the parabola cut off by the latus rectum is rotated (i) about the latus rectum (ii) about the axis. Show that the volumes generated are in the ratio 16:15 7M
5. a) Change the order of integration in  $\int_0^{4a} \int_{x^2/4a}^{2\sqrt{ax}} dy dx$  and hence evaluate. 7M
- b) Evaluate  $\int_0^a \int_0^x \int_0^{x+y} e^{x+y+z} dz dy dx$  7M
6. a) Find the Laplace transform of  $f(t) = |t-1| + |t+1|$ ,  $t \geq 0$  7M
- b) Find the inverse Laplace transform of  $\frac{2s-5}{4s^2+25} + \frac{4s-18}{9-s^2}$  7M
7. Solve the differential equation  $y^{11} + y = t$ ,  $y(0) = 1$ ,  $y^1(0) = 2$  using Laplace transform 14M
8. Verify Stokes theorem for the vector field  $\vec{F} = (2x-y)\vec{i} - yz^2\vec{j} - y^2z\vec{k}$  over the upper half of the sphere  $x^2 + y^2 + z^2 = 1$  bounded by its projection on  $xy$ -plane. 14M

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