Code :9ABS103 **1**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING CHEMISTRY
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Define ppm? What is degree of hardness of water?
   (b) What are boiler troubles? How are they caused? Give suggestions to minimize the troubles.
   (c) What is break point chlorination? State its significance.
2. Explain various factors influence the corrosion of metals?
3. Explain Chain polymerization and Step polymerization with examples.
4. (a) How are lubricant classified? Give example.
   (b) Explain the Boundary film lubrication theory and the mechanism of the lubricants.
5. (a) Define the Cell Constant of a Conductivity Cell? Explain how it is measured? What are its Units.
   (b) The resistance of N/2 solution of an electrolyte in a well was found to be 50 ohm. Calculate the equivalent conductance of the solution, if the electrode in cell are 2.2 cm apart and with an area of 3.8 Sq cm.
6. (a) Draw and explain the phase diagram of one component system, three phase system.
   (b) Explain reason that the fusion curve of ice has negative slope whereas the sublimation curve has a positive slope in the phase diagram.
7. (a) With a neat diagram describe the orsats gas analysis method. What are the special precaution to be taken in the measurement.
   (b) Define calorific values of a fuel. Distinguish gross and net calorific value of fuel.
8. What are Refractories? Explain Thermal spalling, strength and porosity of the refractories.

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Code :9ABS103 **2**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING CHEMISTRY
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. Describe the estimation of dissolved oxygen present in water with principle and chemical equations.
2. (a) Differentiate between Cathodic and Anodic protection.
   (b) Write a note on Inhibitors.
3. Differentiate Thermosetting and Thermoplastic plastics with suitable examples.
4. (a) Distinguish between fluid film and boundary film lubrications.
   (b) Explain the classification of lubricants and give example for each.
5. (a) What is meant by Conductometric titrations? What is the basic principle involved in it .
   (b) What are the advantages of conductometric titrations?
6. Discuss the phase diagram of two-component system by taking suitable example.
7. (a) An oil on analysis gave the following results. C=85%, H=12% and O=3%. Find the weight of minimum air required for burning of 1kg of the fuel .
   (b) Write a note on synthetic petrol.
8. (a) Give an account of the functions and significance of the ingredients of cement.
   (b) How is Portland cement manufactured by dry process?

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Code :9ABS103 **3**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING CHEMISTRY
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. Describe the basic principle involved in the estimation of alkalinity of water and give detailed procedure for the estimation of alkalinity of water.
2. Explain the theory and mechanisms of Corrosion.
3. Explain any two moulding methods with neat labeled diagrams.
4. (a) Discuss the function of lubricants.
   (b) Describe the mechanism of extreme pressure lubricant.
5. (a) Discuss the titration curve obtain in conductometric titration of weak acid and strong base?
   (b) What are the limitations of conductometric titrations?
6. (a) What is condensed system? Write the reduced phase rule equation.
   (b) Write short notes on Freezing mixtures.
7. What are the characteristics of metallurgical coke? Describe the manufacture of metallurgical coke by Ott-Hoffman's method.
8. (a) What is meant by setting and hardening of cement.
   (b) With the help of sequence of chemical reactions explain the setting and hardening of cement.

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Code :9ABS103 4

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING CHEMISTRY
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Explain the principle involved in the estimation of dissolved oxygen in water. samples.
   (b) Give detailed procedure for the determination of dissolved oxygen in water.
2. (a) Explain the mechanism of Dry corrosion.
   (b) Write a note on galvanic corrosion.
3. (a) Write short notes on compounding of rubber.
   (b) Discuss about vulcanization of rubber.
4. (a) What are viscosity and viscosity index of lubricating oil?
   (b) Discuss the functions of lubricants.
5. (a) Discuss the titration curve obtain in conductometric titration of strong acid and weak base?
   (b) Discuss the titration curve obtain in conductometric redox titration?
6. (a) What is meant by degree of freedom? Explain the significance of degree of freedom with suitable example.
   (b) Define the term triple point? Discuss the significance of triple point in the phase diagram of water system.
7. (a) What is meant by Synthetic petrol? How do you synthesis petrol by Fisher-Tropsch process.
   (b) What is a coal? Explain the significance of Anthracite coal.
8. (a) Explain the differences between the acidic basic and neutral refractories with suitable examples.
   (b) What is meant by pyrometric cone equivalent of a cone? Explain.

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Code :9ABS104 **1**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
MATHEMATICS-I
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Solve : $(y^2 - 2xy)dx = (x^2 - 2xy)dy$.
   (b) Solve : $(x^2 - ay)dx = (ax - y^2)dy$.

2. (a) Solve : $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = e^{2x}$
   (b) Solve : $(D^3 - 5D^2 + 8D - 4)\, y = e^{2x}$

3. (a) Verify Rolle's theorem for $f(x) = x(x + 3)\, e^{-x/2}$ in [-3, 0].
   (b) Verify Rolle's theorem for $f(x) = e^x \sin x$ in $[0, \pi]$.

4. (a) Find the radius of curvature at any point on the curve $y = c\cosh\frac{x}{c}$.
   (b) Find the radius of curvature of the curve $x^2y = a(x^2 + y^2)$ at (-2a, 2a).

5. (a) Evaluate $\int_0^3 \int_1^2 xy(1 + x + y)dy\, dx$
   (b) Evaluate the integral by changing the order of integration $\int_0^3 \int_1^{\sqrt{4-y}} (x + y)\, dx\, dy$.

6. (a) Find the Laplace Transform of $\left\{\left(\sqrt{t} + \frac{1}{\sqrt{t}}\right)^3\right\}$
   (b) Find $L^{-1}\left\{\frac{s}{s^4+4a^4}\right\}$.

7. (a) Using Laplace transform, evaluate $\int_0^\infty \frac{\left(e^{-t} - e^{-2t}\right)}{t}$ dt.
   (b) Solve the D.E $(D^2+n^2)y=a \sin(nt+\alpha)$,given y=Dy=0 at t=0 Using Laplace transform.

8. (a) Find the directional derivative of the function $f=x^2-y^2+2z^2$ at the point P (1, 2, 3) in the direction of the line PQ where Q is the point (5, 0, 4).
   (b) Evaluate the Line integral $\int_c [(x^2 + xy)dx + (x^2 + y^2)dy]$ where c is the squre formed by the lines $x = \pm 1$ and $y = \pm 1$.

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Code :9ABS104 **2**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
MATHEMATICS-I
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Solve : $\left(1+e^{x/y}\right)dx+\left(1-\frac{x}{y}\right)e^{\frac{x}{y}}dy=0$
   (b) Solve : x dx + y dy = $\frac{xdy-ydx}{x^2+y^2}$.
2. (a) Solve : (D^2 - 3D + 2)y = cos hx
   (b) Solve : (D + 2) (D - 1)^2 4 = e^{-2x} + 2 sin hx
3. (a) Verify Rolle's theorem for f(x) = x^2 - 5x + 6 in [2, 3].
   (b) Examine if Rolle's theorem is applicable for the function f(x) = tan x in [0, π].
4. (a) Trace the curve y = x^3.
   (b) Trace the curve y = (x - 1) (x - 2) (x - 3).
5. (a) Evaluate $\int_0^4\int_0^{x^2} e^{y/x}dy\,dx$.
   (b) Evaluate the integral by changing the order of integration $\int_0^{4a}\int_{x^2/4a}^{2\sqrt{ax}} dy\,dx$.
6. (a) If f(t) is a periodic function with period T, prove that $L\{f(t)\}=\frac{1}{1-e^{-sT}}\int_0^T e^{-st}f(t)dt$.
   (b) Use Heaviside's expansion formula to find $L^{-1}\left\{\frac{1}{s^3+1}\right\}$.
7. (a) Using Laplace transform, evaluate $\int_0^\infty \frac{(\cos 5t-\cos 3t)}{t}$ dt.
   (b) Solve the D.E. $\frac{d^2x}{dt^2}+9x=\sin t$ Using L.T. given that x(0)=1, $x\left(\frac{\pi}{2}\right)=1$.
8. (a) Find the angle between the surfaces $x^2+y^2+z^2=9$ and $z=x^2+y^2-3$ at the point (2,-1, 2).
   (b) Apply Greens theorem to evaluate $\int_c[(2x^2-y^2)dx+(x^2+y^2)dy]$, where C is the boundary of the area enclosed by the x-axis and upper half of the circle $x^2 + y^2 = a^2$.

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Code :9ABS104 **3**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
MATHEMATICS-I
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Solve : $\frac{dy}{dx} + \frac{y\cos x+\sin y+y}{\sin x+x\cos y+x} = 0$
   Solve : $\frac{y(xy+e^x)dx-e^x dy}{y^2} = 0$
2. (a) Solve : $(D^2 - 3D + 2)\, y = e^{5x}$.
   (b) Solve : $(D^2 - 5D + 6)y = 4^{ex} + 5$.
3. (a) Calculate an approximate value of $\sqrt[6]{65}$ using Lagrange's mean value theorem.
   (b) Find an approximate value for the root of $x^3 - 2x - 5$ in (2, 3)
4. (a) Find the perimeter of the curve $x^2 + y^2 = r^2$.
   (b) Find the length of the arc of the parabola $x^2 = 4ay$ from vertex to one extremity of the latusrectum.
5. (a) Evaluate $\int_0^1 \int_x^{\sqrt{x}} (x^2 + y^2)dx\, dy$.
   (b) Evaluate the integral by changing the order of integration $\int_0^1 \int_x^{\sqrt{2-x^2}} \frac{x\, dy\, dx}{\sqrt{x^2+y^2}}$.
6. (a) Find the Laplace Transform of $\left\{\left(\sqrt{t} - \frac{1}{\sqrt{t}}\right)^3\right\}$
   (b) Find $L^{-1}\left\{\frac{1}{2}\log\left(\frac{s^2+b^2}{s^2+a^2}\right)\right\}$.
7. (a) Using Laplace transform, evaluate $\int_0^\infty e^{-at}\frac{\sin^2 t}{t}dt$.
   (b) Solve the D.E $(D^2+n^2)x=a\sin(nt+\alpha)$,given x=Dx=0 at t=0 Using Laplace transform.
8. (a) Find the directional derivative of $2xy+z^2$ at (1,-1,3)in the direction of $\bar{i} + 2\bar{j} + 3\bar{k}$.
   (b) Find the works done by the force $\overline{F} = (2y + 3)i + (zx)j + (yz - x)k$ when it moves a particle from the point (0,0,0) to (2,1,1) along the curve $x = 2t^2$, $y = t$, $z = t^3$.

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Code :9ABS104 **4**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
MATHEMATICS-I
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Solve :$(x^2-1)\frac{dy}{dx}+2xy=1$
   Solve :$x\frac{dy}{dx}+y=\log x$.
2. (a) Solve : $(D^2 - 4)y = 2\cos^2 x$.
   (b) Solve : $(D^2 - 3D + 2)y = \cos 3x$.
3. (a) Expand $\log_e x$ in powers of (x - 1) and hence evaluate log1.1 correct to 4 decimal places.
   (b) Calculate the approximate value of $\sqrt{10}$ correct to 4 decimal places using Taylor's theorem.
4. (a) Find the volume of the solid generated by revolving the ellips $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$.
   (b) Find the volume of the reel shaped solid formed by the revolution about the y - axis of the part of the parabola $y^2 = 4ax$ cut off by the latusrectum.
5. (a) Evaluate $\int_0^5\int_0^{x^2} x(x^2+y^2)dx\,dy$
   (b) Evaluate the integral by changing the order of integration $\int_0^a\int_{x/a}^{\sqrt{x/a}}(x^2+y^2)dx\,dy$.
6. (a) Find $L\left\{t^{\frac{7}{2}}e^{3t}\right\}$.
   (b) Find $L\left\{e^{-4t}\int_0^t\frac{\sin 3t}{t}dt\right\}$.
7. (a) Solve the integral equation $y(t)=1+\int_0^t y(u)\sin(t-u)du$, Using Laplace transform.
   (b) Solve the D.E. y"+y=t , y(0)=1, y'(0)=-2. Using Laplace transform.
8. (a) In what direction from (3, 1,-2) is the directional derivative of $f(x,y,z)=x^2y^2z^4$ maximum and what is its magnitude?
   (b) A Vector field is given by F = (sin y) i + x(1+cos y)j. Evaluate the line integral over the circular path given by $x^2 + y^2 = a^2$, z = 0.

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Code :9ABS105 **1**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
MATHEMATICAL METHODS
(Common to Computer Science & Engineering, Electronics & Communication Engineering, Electrical & Electronics Engineering, Electronics & Instrumentation Engineering, Electronics & Computer Engineering, Electronics & Control Engineering, Information Technology, Computer Science & Systems Engineering)

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

Answer any FIVE questions
All questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Find the rank of the matrix A= $\begin{pmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{pmatrix}$

   (b) If A= $\begin{pmatrix} 4 & -1 & 1 \\ 2 & 0 & -1 \\ 1 & -1 & 3 \end{pmatrix}$, find A^{-1}.

2. (a) Prove that the eigen values of a Hermitian matrix are all real.

   (b) Reduce the following quadratic form to canonical form by Lagrange's reduction. x^2 - $14y^2$ + $2z^2$ + 4xy + 16yz + 2zx and hence find the index, signature and nature of the quadratic form.

3. (a) Find and approximate value of the real root of x^3 - x - 1 = 0 using the Bisection Method.

   (b) Find the root of the Equation x $\log_{10}(x) = 1.2$ using false position method.

4. (a) Fit the straight line to the following data

x:	0.0	0.2	0.4	0.6	0.8	1.3
y :	-1.85	-1.20	-0.55	0.15	0.80	1.35

   by the method of least squares.

   (b) A slider in a machine moves along a fixed straight rod. Its distance x cm along the rod is given below for various values of the time t seconds. Find the velocity of the slider and its acceleration when t = 0.3 seconds.

t:	0	0.1	0.2	0.3	0.4	0.5	0.6
x:	30.13	31.62	32.87	33.64	33.95	33.81	33.24

5. (a) Find by Taylor's series method the value of y at x=0.1 to five places of decimals from $\frac{dy}{dx} = x^2y - 1, y(0) = 1$.

   (b) Find the value of y at x=0.1 by Picard's method, given that $\frac{dy}{dx} = \frac{y-x}{y+x}, y(0) = 1$.

6. (a) Obtain the Fourier series to represent $f(x) = \frac{1}{4}(\pi - x)^2$ in $0 < x < 2\pi$.

   (b) Express $f(x) = \begin{cases} 1 \; for \; 0 \le x \le \pi \\ 0 \; for \; x > \pi \end{cases}$ as a Fourier sine integral.

7. (a) Form the partial differential equation by eliminating the arbitrary constants a and b if $4(1 + a^2)z = (x + ay + b)^2$.

   (b) Solve the by the method of separation of variables $4u_x + u_y = 3u$ and $u(0, y) = e^{-5y}$.

8. (a) State and Prove Damping rule for Z-transform.

   (b) Find $Z^{-1}\left\{\frac{z}{z^2+11z+24}\right\}$.

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Code :9ABS105 **2**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
MATHEMATICAL METHODS
(Common to Computer Science & Engineering, Electronics & Communication Engineering, Electrical & Electronics Engineering, Electronics & Instrumentation Engineering, Electronics & Computer Engineering, Electronics & Control Engineering, Information Technology, Computer Science & Systems Engineering)

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

Answer any FIVE questions
All questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Reduce the $\begin{pmatrix} 1 & 0 & -3 & 2 \\ 0 & 1 & 4 & 5 \\ 1 & 3 & 2 & 0 \\ 1 & 1 & -2 & 0 \end{pmatrix}$ matrix, to normal form and find its rank.
   (b) Solve the system 2x - y + 4z = 12; 3x + 2y + z = 10; x + y + z = 6; if it is consistent.
2. (a) Prove that the eigen values of a real symmetric matrix are all real.
   (b) Reduce the following quadratic form to canonical form by Lagrange's reduction.
   $xy + y^2 + 4xz + z^2$ and hence find the index, signature and nature of the quadratic form.
3. (a) Find out the square root of 25 given $x_0 = 2.0$, $x_1 = 7.0$ using Bisection method.
   (b) Find out the roots of the equation x^3 - x - 4 = 0 using false position method.
4. (a) Fit a straight line to the following data.

x:	4	6	8	10	12
y:	13.72	12.90	12.01	11.14	10.31

   (b) Evaluate approximately, by trapezoidal rule, $\int_0^1 (4x - 3x^2)dx$.
   By taking n = 10. Compute the exact integral and find the absolute and relative error.
5. Using modified Euler's method, find an approximate value of y when x=0.3, given that $\frac{dy}{dx} = x + y, y(0) = 1$.
6. (a) Obtain the Fourier series to represent f(x) = e^{ax} in $0 < x < 2\pi$.
   (b) If F (s) is the complex Fourier transform of f(x) , then prove that $F\{f(x)\cos ax\} = \frac{1}{2}\{F(s+a) + F(s-a)\}$.
7. (a) From the partial differential equation by eliminating the arbitrary constants a ,b and c From z=a(x+y)+b(x-y)+abt+c.
   (b) Use the separation of variables technique to solve $3u_x+2u_y=0$ with $u(x,0)=4e^{-x}$
8. (a) Find $Z\left\{\cos\left(\frac{n\pi}{2}\right)\right\}$ *and* $Z\left\{\sin\left(\frac{n\pi}{2}\right)\right\}$.
   (b) State and prove convolution theorem for Z-transform.

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Code :9ABS105 **3**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
MATHEMATICAL METHODS
(Common to Computer Science & Engineering, Electronics & Communication Engineering, Electrical & Electronics Engineering, Electronics & Instrumentation Engineering, Electronics & Computer Engineering, Electronics & Control Engineering, Information Technology, Computer Science & Systems Engineering)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) If $A = \begin{pmatrix} 1 & -1 & -1 & 2 \\ 4 & 2 & 2 & -1 \\ 2 & 2 & 0 & -2 \end{pmatrix}$, find two non-singular matrices P and Q such that PAQ is in the normal form.
   (b) If consistent, solve the system of equations, x + y + z +t = 4; x - z + 2t = 2; y + z -3t = -1; x + 2y - z + t = 3.

2. Reduce the quadratic form $x^2 + 4xy + y^2$ to the canonical form by orthogonal reduction. Find the index, signature and nature of the quadratic form.

3. (a) Find a root of the equation x^3 - 4x - 9 =0 using bisection method in four stages.
   (b) Explain the Iterative method approach in solving the problems.

4. (a) Fit a second degree parabola to the data

x:	0	1	2	3	4
y:	1.0	1.8	1.3	2.5	6.3

   (b) Evaluate $\int_0^{\pi/2} \sin x \, dx$ by Simpson's $\frac{1}{3}$ rule and compare with the exact value.

5. Solve by the Taylor's series method of third order problem $\frac{dy}{dx} = (x^3 + xy^2)e^{-x}, y(0) = 1$ for x=0.1,0.2,0.3.

6. (a) Find a Fourier series to represent f(x)=x-x^2 in $-\pi \leq x \leq \pi$.. Hence show that $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \cdots\cdots = \frac{\pi^2}{12}$.
   (b) If F(s) is the complex Fourier transform of f(x) , then prove that F{f(x-a)=e^{isa} F(s).

7. A string of length l is initially at rest in equilibrium position and each of its points is given the Velocity $\left(\frac{\partial y}{\partial t}\right)_{t=0} = b\sin^3\left(\frac{\pi x}{l}\right)$. Find displacement y(x,t).

8. (a) Find $Z\left\{\frac{1}{n(n+1)}\right\}$.
   (b) Use convolution theorem to evaluate $Z^{-1}\left\{\left(\frac{z}{z-a}\right)^3\right\}$.

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Code :9ABS105 **4**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
MATHEMATICAL METHODS
(Common to Computer Science & Engineering, Electronics & Communication Engineering, Electrical & Electronics Engineering, Electronics & Instrumentation Engineering, Electronics & Computer Engineering, Electronics & Control Engineering, Information Technology, Computer Science & Systems Engineering)

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

Answer any FIVE questions
All questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Reduce the matrix to Echelon form and find its rank
$$\begin{pmatrix} -1 & -3 & 3 & -1 \\ 1 & 1 & -1 & 0 \\ 2 & -5 & 2 & -3 \\ -1 & 1 & 0 & 1 \end{pmatrix}$$
   (b) Test for consistency and if consistent solve the system,
   5x + 3y + 7t = 4; 3x + 26y + 2t = 9; 7x + 2y + 10t = 5

2. Reduce the quadratic form, q= $3x^2$ - $2y^2$ - z^2 - 4xy + 12yz + 8xz to the canonical form by orthogonal reduction. Find its rank, index and signative. Find also the corresponding transformation.

3. (a) Find the root of the equation x sin x + cos x = 0. Using Newtion- Raphson method.
   (b) For x = 0 , 1, 2, 4, 5; f(x) = 1, 14, 15, 5, 6. Find f(3) using forward difference table.

4. (a) Fit a second degree parabola to the following data

x:	0	1	2	3	4
y:	1	5	10	22	38

   (b) Evaluate $\int_0^{\pi/2} e^{\sin x}\,dx$ correct to four decimal places by Simpson's three- eighth rule.

5. (a) Write the Runge-Kutta fourth order formulae.
   (b) Using the Taylor's series method, solve $\frac{dy}{dx} = 2y + 3e^x, y(0) = 0$ at x=01,0.2.

6. (a) Express f(x)=x as a half-range cosine series in the interval $0 < x < 2$.
   (b) Find the Fourier cosine transform of $\frac{e^{-ax}}{x}, (a > 0)$

7. The points of trisection of a string are pulled aside through the same distance on opposite sides of the position of equilibrium and the string is released from rest. Derive an expression for the displacement of the string at subsequent time and show that the mid-point of the string always remains at rest.

8. (a) State and prove final value theorem for Z-transform.
   (b) Find $Z^{-1}\left\{\frac{2z^2+3z}{(z+2)(z-4)}\right\}$.

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Code :9A01101 **1**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING MECHANICS
(Common to Aeronautical Engineering, Biotechnology, Civil Engineering, Mechanical Engineering, Mechatronics)

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

Answer any FIVE questions
All questions carry equal marks
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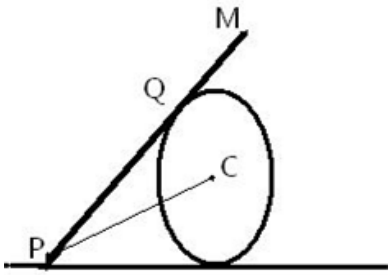
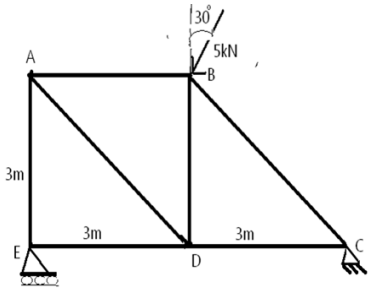
1. A smooth right circular cylinder of radius 16cm rests on horizontal plane and is kept from rolling by an inclined string PC of length 32cm. A prismatic bar PQM of length 48cm and weight 530N is hinged at P and leans against the cylinder, as shown in fig. Determine the tension in the string PC.



2. Find the axial forces of simply supported frame as shown in the below figure.



3. A screw jack raises a load of 40 KN. The screw is square threaded having 3 threads per 20 mm length and 40 mm in diameter. Calculate the force required at the end of a lever 400 mm long measured from axis of screw, if coefficient of friction between screw and nut is 0.12.

4. (a) To determine centriod for the rectangle lamina, having a width of"b" and height of "h"
   (b) To determine the centriod for triangular lamina, having a base "b" and height "h".

5. (a) Define mass moment of inertia and explain transfer formula for mass moment of inertia.
   (b) Determine the mass moment of inertia of slender rod of length 'l' about its centroidal axis normal to the rod.

6. (a) An electric train which starts from one station is uniformly accelerated for the first 10 seconds during which period it covers 150 m. It then runs with constant speed until it is finally retarded uniformly in the last 40 m. Calculate the maximum speed and the time taken over the journey to the next stopping station which is 600 m from the previous station.
   (b) A flywheel which is at rest attains a constant speed of 300 rpm after accelerating uniformly for 10 seconds; determine the number of revolutions made by the flywheel during the speed.

7. (a) What is the advantage of work-energy theorem?
   (b) A shaft of radius 'r' rotates with constant angular speed 'w' in bearings for which are coefficient of friction is μ. Through what angle '$\emptyset$' will it rotate after the driving force is removed.

8. (a) Differentiate between free and damped vibrations
   (b) The amplitude of a simple harmonic motion is 0.5 m and the period is 1 sec. Determine the max. velocity and max. acceleration.

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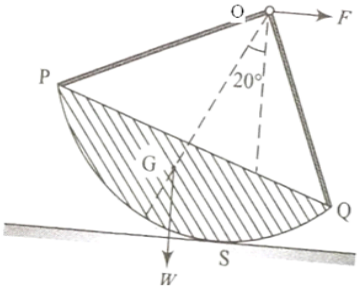
Code :9A01101 **2**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING MECHANICS
(Common to Aeronautical Engineering, Biotechnology, Civil Engineering, Mechanical Engineering, Mechatronics)

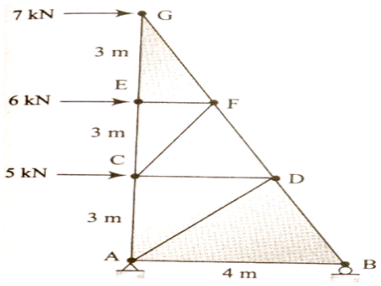
Time: 3 hours **Max Marks: 70**

Answer any FIVE questions
All questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. A rocker of weight 20kg has a circular shoe of radius 45cm rests on smooth horizontal floor at S and is pulled by a force F. If the position of the equilibrium is defined by an angle 20^0 [show in figure below], determine the equilibrant force F. Take OG = 29cm.



2. Compute the induced axial forces in all the members of the loaded frame as shown in the below figure.



3. A block weighing 100 N is resting on a rough plane inclined 20 degrees to the horizontal. It is acted upon by a force of 50N directed upward at angle of 14^0 above the plane. Determine the friction. If the block is about to move up the plane, determine the co-efficient of friction

4. A steel ball of diameter 150 mm rests centrally over a concrete cube of size 150mm. Determine the center of gravity of the system, taking weight of concrete=25000N/m^2 and that of steel 80000N/m^2.

5. Derive the expression for mass moment of inertia of a homogeneous sphere of radius 'r' and mass density 'w', with reference to its diameter.

6. (a) A train is uniformly accelerated and passes successive kilometer stones with velocities of 18 Kmph and 36 Kmph respectively. Calculate the velocity when it passes the third kilometer station. Also find the time taken for each of the two intervals of one kilometer.
   (b) A homogeneous sphere of radius of a = 100 mm and weight W = 10 N Can rotate freely about a diameter. If it starts from rest and gains with constant angular acceleration, angular speed N = 180 rpm, in12 revolutions, find the action moment.

7. (a) What is the energy of the motion for a rigid body rotating about a fixed axis?
   (b) A 70 kg sprinter starts from rest and accelerate uniformly for 5.8 s over a distance of 34.5 m. Neglecting air resistance, determine the average power developed by the sprinter.

8. A particle is moving in SHM has a frequency of 10 oscillations per minute. At a distance of 8 cm from the mean position, its velocity is 3/5 th of the max. velocity. Find the:
   (a) Amplitude oscillations.
   (b) Max. acceleration.
   (c) Velocity of the particle. When it is at a distance of 5 cm from mean position.

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Code :9A01101 **3**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING MECHANICS
(Common to Aeronautical Engineering, Biotechnology, Civil Engineering, Mechanical Engineering, Mechatronics)

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

Answer any FIVE questions
All questions carry equal marks
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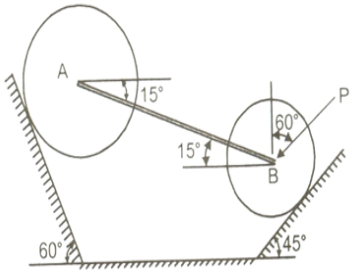
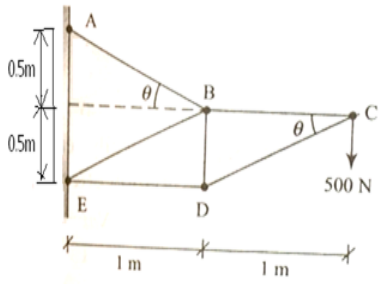
1. Two cylinders, A of weight 4000 N and B of weight 2000 N rest on smooth inclines as shown in fig. Below .they are connected by a bar of negligible weight hinged to each cylinder at its geometric center by smooth pins. Find the force P to be applied as shown in figure such that it will hold the system in the given position.



2. Determine the axial forces in the members of plane frame as shown in the below figure.



3. (a) Explain the working principle of screw jack with neat sketch.
   (b) Explain laws of friction.

4. A steel cylinder of diameter 200 mm and height of 300mm rests centrally over a concrete rectangle of 1000 X 800 X 600 mm size. Determine the center of gravity of the system, taking weight of concrete=28500N/m^2 and that of steel 81000N/m^2 .

5. Derive the expression for mass moment of inertia of a cone of height 'h' and base radius 'r' and mass density 'w' with respect to its geometrical axis.

6. (a) The distance covered by a freely falling body in the last one second of its motion and that covered in the last but one second are in the ratio 5:4. Calculate the height from which the body was dropped and the velocity with which it strikes the ground.
   (b) A ball projected vertically upward attains a maximum height of 400 m. Calculate the velocity of projection and compute the time of flight in air. At what altitude will this ball meet a second ball projected vertically upward 4 seconds later with a speed of 120 m/sec.

7. A solid cylinder of weight 'w' and radius 'r' rolls, down an inclined plane which makes an angle θ with the horizontal axis. Determine the minimum coefficient of friction and the acceleration of the mass center for rolling, without slipping.

8. A particle with a simple harmonic motion has an amplitude of 375 mm and a period of $\pi/2$ sec. Find the velocity and acceleration of the particle when it has traveled 225 mm to the right of the center of its path. What time is required for this displacement?

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Code :9A01101

4

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING MECHANICS
(Common to Aeronautical Engineering, Biotechnology, Civil Engineering, Mechanical Engineering, Mechatronics)

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

Answer any FIVE questions
All questions carry equal marks
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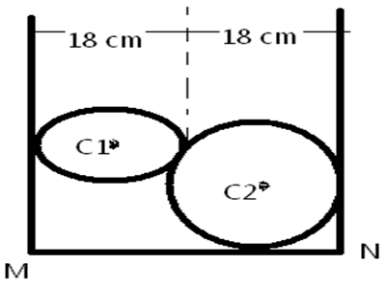
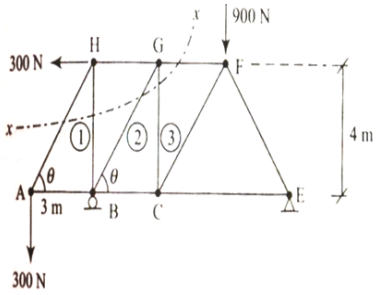
1. Two balls of weight 100kg and 150 kg having radius 10cm and 15 cm, respectively, are placed one above another inside a hallow circular cylinder of radius 18cm, open at both ends, as shown in fig. Neglecting the effect of friction, determine the self weight of cylinder so that it will not tip over.



2. Using method of section, find the forces in BH, BG and CG of the given frame as shown in the below figure.



3. Write short notes on:
(i) Cone friction (ii) Rolling friction (iii) Limiting friction (iv) Condition for self locking in a simple screw jack.

4. Determine the center of gravity of solid hemisphere of radius 'r' from the diametral axis.

5. (a) Show that the moment of inertia of a thin circular ring of mass 'M' and mean radius 'R' with respect to its geometric axis is MR^2.
   (b) Find the mass moment of inertia of a right circular cone of base radius 'R' and mass 'M' about the axis of the cone.

6. (a) A fighter plane is directly over an aircraft gun at time t = 0 and an altitude of 1800m. The plane is moving with a speed of 600 Kmph. A shell is fired at a time t = 0 in an attempt to hit the plane. If the muzzle velocity is 1000m/sec, Find out the angle at which the gun should be held.
   (b) A 600 mm diameter flywheel is brought uniformly from rest to a speed of 350 rpm in 20 seconds. Determine the velocity and acceleration of a point on the rim 2 seconds after starting from rest.

7. (a) State the principle of the conservation of momentum.
   (b) A golfer hits a 46 g ball with an initial velocity of 48 m/sec at an angle of 24^0 with the horizontal. Determine:
   (i) The initial KE of the ball (ii) The KE of the ball when it reaches its max. height.

8. A simple pendulum is suspended from the roof of an elevator which is accelerating at 'a' m/sec^2. Assuming that the vibrations are small, determine the period of oscillation of the pendulum when the elevator is
(i) Accelerating upward (ii) Accelerating downward (iii) Falling freely.

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Code :9A03101a

1

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Common to Aeronautical Engineering, Civil Engineering, Electrical & Electronics Engineering, Biotechnology, Electronics & Instrumentation Engineering)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) construct a pentagon length of a side is 30 mm.
   (b) Draw an arc passing through three points not in straight line.
   (c) Construct a parabola, with the distance of the focus from the directrix as 50 mm, also draw normal and tangent to the curve at a point 40 from the directrix.
2. (a) A line AB, 65 mm long has its end A in the H.P. and 15 mm in front of the V.P. The end B is in the third quadrant. The line is inclined at 30^0 to the H.P. and at 60^0 to the V.P. Draw its projections.
   (b) A line PQ 75 mm long has its end P in both HP and VP .It is inclined at an angle of 30^0 to HP and 45^0 to VP. Draw projections of the line
3. (a) A square lamina of 50 mm side is inclined at 45^0 to V.P and parallel to H.P Draw it projections.
   (b) An equilateral triangle lamina of side 30 mm parallel to H.P. and to V.P. One of its side is 20 mm in front of V.P. and 30 mm above H.P. Draw its projections.
4. (a) A hexagonal prism has one of its rectangular faces parallel to the H.P. its axis is perpendicular to the V.P.and 3.5 cm above the ground.
   (b) Projection of cylinder 60 mm diameter and 90 mm long. Axis inclined at 45^0 to H.P. and parallel to V.P.
5. (a) A cylinder of base diameter 40 mm and axis length 60 mm is resting on HP on one of its generators with its axis parallel to VP. it is cut by a plane inclined at 40^0 to VP and perpendicular to HP and is bisecting the axis of the cylinder. Draw its top view, sectional front view and true shape of section.
   (b) A hexagonal prism of side 50 mm is resting on HP on one of its base with two vertical faces being parallel to VP. It is cut by a vertical plane inclined at 45^0 to VP and is 8 mm away from the axis. Draw its top view, sectional front view and true shape of section.
6. A cylinder 50 mm diameter and 60 mm height stands on H.P.A section perpendicular to V.P, inclined at 55^0 to HP cuts the cylinder and passes through a point on the axis at a height of 45 mm above the base . Draw the isometric projection of the truncated portion of the cylinder, when the cut surface is clearly visible to the observer.
7. Two cylinders each of 30 mm diameter and altitude 80 mm intersect each other at right angles. Their axes bisect each other and are parallel to VP. Determine the line of intersection of the two cylinders. Also, develop the lower portion of the vertical cylinder, neglecting the thickness of the metal.
8. A cylinder of base 50 mm diameter and axis 75 mm long, has a coaxial square hole of 25 mm side. The cylinder is resting on the ground, with its base parallel to PP and 10 mm behind it. The faces of the hole are equally inclined to GP. The station point is 50 mm to the left of the axis of the solid, 45 mm in front of PP and 70 mm above GP. Draw the perspective projection of the solid.

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Code :9A03101a

2

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Common to Aeronautical Engineering, Civil Engineering, Electrical & Electronics Engineering, Biotechnology, Electronics & Instrumentation Engineering)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Inscribe a regular octagon in a given square of 50 mm side.
   (b) A circle of 45mm diameter rolls along the inside of another circle of 180mm diameter draw the path described by a pint on the circumference of the rolling circle of one complete revolution draw a tangent and normal at a point on the curve.

2. A line AB 120 mm long is inclined at 45^0 to HP and 30^0 to the VP. It's mid -point C is in VP and 20 mm above HP. The end A is in third quadrant and B is in first quadrant. Draw the projections of the line.

3. (a) A regular pentagon of 25 mm side has one side on the ground. Its plane is inclined to H.P at 45^0 and perpendicular to V.P Draw its projections
   (b) Draw the projections of circle diameter of 5 cm having its plane vertical and inclined at 30^0 to the V.P Its center is 3 cm above H.P and 2 cm in front of V.P.

4. (a) Pentagonal prism base 30 mm side and axis 60 mm long has an edge of its base in H.P. axis is inclined at 45^0 ton ground and parallel to V.P.
   (b) Projection of a cone, base 75 mm diameter and axis 100 mm long lying on H.P. with its axis parallel to V.P. and inclined at 30^0 to H.P.

5. (a) A sphere of 60 mm diameter is cut by a cutting plane inclined at 55^0 to VP and perpendicular to HP and it is 12 mm away from the center of the sphere. Draw its top view, sectional front view and true shape of section.
   (b) A cone, diameter of base 45 mm and axis 60 mm is resting on its base on the HP. It is cut by a section plane perpendicular to the VP and inclined at 80^0 to the HP. The section plane passes through the apex. Draw the sectional top view and also obtain the true shape of the cut section.

6. A pentagonal pyramid, 30 mm edge of base and 65 mm height , stands on H.P such that an edge of the base is parallel to VP and nearer to it .A section plane perpendicular to VP and inclined at 30^0 to HP cuts the pyramid passing through a point on the axis at a height of 35 mm from the base. Draw the isometric projection of the truncated pyramid.

7. (a) A vertical cylinder of diameter 80 mm intersects a horizontal cylinder of diameter 40 mm. The shortest distance between their axes is 40 mm. Draw the projections showing the intersection profile.
   (b) A horizontal cylinder of 50 mm diameter penetrates a vertical cylinder of 75 mm diameter resting on HP. The two axes are coplanar. The axis of the horizontal cylinder is 50 mm above the HP. Draw the projections showing the curves of intersection.

8. Draw the perspective projection of a shed with one corner of the longer side of the roof touching the PP at a point. The eye is 5 m in front of the point touching the pp and 2m above the GP. The roof of the shed is supported on four pillars of 50 cm x 50 cm x 6 m high. The roof comprises of two rectangular surfaces of 15 m x 5 m inclined mutually at 120^0.
   Assume that the outer surfaces of the pillars are in flush with the sides of the roof at the corners.

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Code :9A03101a

3

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Common to Aeronautical Engineering, Civil Engineering, Electrical & Electronics Engineering, Biotechnology, Electronics & Instrumentation Engineering)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Draw one turn of the involutes of a circle 50mm in diameter draw a tangent and normal to the curve at a pint 80mm from the centre of the circle.
   (b) Inscribe a pentagon in a circle of 50 mm diameter
   (c) Construct an ellipse, with distance of the focus from the directrix as 50 and eccentricity as 2/3. Also draw normal and tangent to the curve at a point 40 from the directrix.
2. The mid-point of line is 80 mm long is 25 mm above HP and 30 mm in front of VP. The line inclined at an angle of 30^0 to HP and 40^0 VP. Draw its projections.
3. (a) A regular hexagonal lamina of 30 mm side rests on H.P with its plane surface vertical and inclined at 45^0 to V.P Draw its projections of the plane
   (b) A square plate of side 30 mm is perpendicular to V.P and inclined at 30^0 to H.P Draw it projections.
4. (a) A hexagonal pyramid base 25 mm side axis 50 mm long, has edge of its base on the ground .its axis is inclined at 30^0 to ground ,and parallel to V.P. Draw projections
   (b) Draw the projections of a cone base 75 mm diameter and axis 100 mm long, lying on the H.P. on one of its generators with the axis parallel to the V.P.
5. (a) A sphere of 50 mm diameter is cut by a cutting plane inclined at 50^0 to HP and perpendicular to VP and is 10 mm away from the center of the sphere. Draw its, front view, sectional top view and true shape of section.
   (b) A Cone of base diameter 50 mm and axis length 60 mm is resting on HP on its base, which is cut by a plane inclined at 50^0 to HP and perpendicular to VP and passing through a point, on the base circle of the cone. Draw its front view, sectional top view and true shape of section.
6. (a) Draw the isometric projection of a triangular pyramid of side of base 35 mm and height 75 mm when it is resting on H.P. such that an edge of the base is parallel to V.P.
   (b) Draw the isometric projection of a cone of base 40 mm diameter and height 58 mm when it rest with its base on H.P.(axis is vertical)
7. A cylindrical boiler is 2m in diameter and has a cylindrical dome 0.8m diameter and 0.6m high. The axis of the dome intersects the axis of the boiler. Draw three views of the arrangement. Also develop the surface of the dome. Take a scale of 1 cm = 0.2 m.
8. A model of steps has three steps of 15 mm tread and 10 mm rise. The steps measure 60 mm width wise. Draw the perspective projection of the model when placed with its first step 25 mm within the picture plane and the longer edge being parallel to it. The station point is 95 mm from the picture plane and 60 mm above the ground and lies on the central line.

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Code :9A03101a

4

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Common to Aeronautical Engineering, Civil Engineering, Electrical & Electronics Engineering, Biotechnology, Electronics & Instrumentation Engineering)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) A circle of 40mm diameter rolls on a straight line without slipping. In the initial position, the diameter PQ of the circle is parallel to the line on which it rolls. Draw the locus of the points P and Q for one complete revolution of the circle.
   (b) Draw the curve traced out by the end of the thick wire unwound from an equilateral triangle of side 20mm, the wire being kept tight.
2. The mid-point of straight line AB is 60 mm above HP and in front of VP. The line measures 80 mm long and inclined at an angle of 30^0 to HP and 45^0 VP. Draw its projections.
3. (a) A hexagonal plane of side 30 mm is perpendicular to V.P and Parallel to H.P One of its side is perpendicular to V.P. Draw its projections
   (b) A circular lamina of 30 mm radius is perpendicular to V.P and its diameter AB is inclined at 45^0 to H.P Draw its projections.
4. (a) Draw the projections of hexagonal pyramid with side of base 30 mm and axis 70 mm long resting with slant face on H.P. such that axis parallel to V.P.
   (b) Draw the projections of a right circular cone of base 40 mm diameter and height 60 mm when resting with its base on H.P.
5. (a) Draw the projection of a cylinder of 40 mm diameter and axis 60 mm long, when it is lying on HP, with its axis inclined at 45^0 to HP and parallel to VP.
   (b) Draw the projections of a cone of diameter of base 40 mm and axis 60 mm long, when it is lying on a point of the base on HP, with its axis inclined at 45^0 to HP and perpendicular to VP. Follow the auxiliary method.
6. (a) Draw the isometric projection of a rectangular prism of base 50 mm X40 mm and height 75 mm , when it rest with its base on H.P. and one of its rectangular faces is parallel to V.P.
   (b) Draw the isometric projection of a hollow rectangular prism of base 50X40 mm (outside), height 75 mm and thickness 8 mm when its axis is horizontal.
7. A cylinder of 60 mm diameter and 100 mm height, stands on its base on the ground. It is penetrated centrally by a cylinder of 40 mm diameter and 100 mm long, whose axis is parallel to HP, but inclined at an angle of 30^0 to VP. Draw the projections showing the curves of intersection. Also draw the development of the penetrating cylinders.
8. A man stands at a distance of 5 m from a flight of four stone steps having a width of 2m, treat 0.3m and rise 0.2m. The flight makes an angle of 30^0 with the picture plane and touches the same at a distance of 2 m to the right of the center of vision. Take horizon level to be 1.5m above the ground level. Draw the perspective projection of the flight.

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Code :9A03101b **1**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Common to Mechanical Engineering, Electronics & Control Engineering, Computer Science & Systems Engineering)

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

Answer any FIVE questions
All questions carry equal marks
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1. (a) The asymptotes of a hyperbola are inclined at 70^0 to each other. Construct the curve when a point p on it is at a distance of 20 and 30 from the two asymptotes.
   (b) Draw one turn of the involutes of a hexagon whose inscribed circle is 30mm in diameters.

2. The distance between the projectors of two end of straight line is 60 mm. one end is 15 mm above HP and 50 mm in front of VP. The other end is 60 mm above HP and 10 mm in front of VP. Draw the projections and find true length of the line.

3. (a) An equilateral triangular lamina of 30 mm side with the surface inclined at 60^0 to H.P. lines with One of its sides on H.P. The edge on which it rests is inclined to V.P. at 60^0 to V.P. and its surface making an angle of 45^0 with H.P.
   (b) A rectangular plane of 60mmX40mm is resting on shorter edge on the ground and inclined at 45^0 to V.P. The plane surface is inclined at 30^0 to H.P. Draw its projections.

4. (a) A square prism, side of base 35 mm and height of 50 mm rests with its base on H.P. such that one of its rectangular faces is inclined at an angle of 30^0 to V.P. Draw its projections.
   (b) Draw the projections of a square pyramid having one of its triangular faces in the V.P. and the axis parallel to and 40 mm above the H.P. Base 30 mm side axis 75 mm long.

5. (a) A hexagonal prism of side of side of base 25 mm axis 60 long is freely suspended from a corner of the base. Draw the projections.
   (b) A square pyramid of base 35 mm side and axis 50 mm long, is resting on one of its triangular faces on HP, with the edges of the base containing that faces inclined at 45^0 to VP. Draw the projections of the pyramid. Follow the auxiliary plane method.

6. A square pyramid with base edge 85 mm and height 125 mm , is resting on a cube of side 100mm.The axes of the solids coincide along a line. The two sides of the base of the pyramid are parallel to the edges of the cube. Draw the isometric view of the combination of the solids.

7. A square prism of base 50 mm side and height 125 mm stands on the ground with its side of base inclined at an angle of 30^0 to VP. It is penetrated by a cylinder of diameter 50 mm and axis 125 mm long. The axis of the cylinder is parallel to both HP and VP and bisects the axis of the prism. Draw the projection showing fully the curves of intersection.

8. Draw a perspective view of a square plane with a 60 mm side resting on the GP with one of its corners touching PP and a side right to the corner inclined at 30^0 to it. The station point is 50 mm in front of PP, 60 mm above GP and lies in a CP which is 40 mm towards right of the corner touching the PP.

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Code :9A03101b **2**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Common to Mechanical Engineering, Electronics & Control Engineering, Computer Science & Systems Engineering)

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

Answer any FIVE questions
All questions carry equal marks
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1. (a) A circle of 40 diameter rolls along a line for one revolution clockwise. Draw a locus of a point on the circle, which is in contact with the line.
   (b) Two concentric Discs of 40 mm and 50 mm diameters roll on the horizontal line AB 150 mm long. Both discs start at the same point and roll in the same direction. Plot the curves for the movement of the points lying on their circumferences.
2. A line MN is 70 mm long. It's mid -point is 30 mm above HP and 25 mm in front of VP. The line inclined at an angle of 45^0 to HP and 35^0 VP. Draw its projections.
3. (a) A rectangular lamina of sides 40X60 rests on H.P on one of its longer sides the lamina is tilted about an edge on which it rests till the plane is inclined to H.P. at 45^0. The edge on which it rests is perpendicular to V.P. Draw its projections
   (b) Draw the projections of regular hexagon of 25 mm side having one of its edge in H.P and inclined at 60^0 to V.P and its surface making an angle of 60^0 to H.P.
4. (a) A hexagonal prism base 30 mm side and axis 75 mm long, as an edge of the base parallel to the H.P. and inclined at 45^0 to the V.P. its axis makes an angle of 60^0 with the H.P.
   (b) A triangular prism side of base 35 mm and height 60 mm lies with one of its longer edges on H.P. such that its axis is parallel to both H.P. and V.P. Draw its projections.
5. (a) A pentagonal prism of side of base 25 mm and axis 40 mm long, is resting on HP on a corner of its base. Draw the projections of the prism, when the base is inclined at 60^0 to HP and the axis appears to be inclined at 30^0 to VP.
   (b) A hexagonal prism of base 25 mm side and axis 45 mm long, is positioned with one of its base edges on HP such that, the axis is inclined at 30^0 to HP and 45^0 to VP. Draw its projections.
6. A circular block of 75 mm diameter and 25 mm thick, is pierced centrally through its flat faces, by a square prism of base 35 mm side and 125 mm long ,which comes out equally on both sides of the block . Draw the isometric projection of the combination when the combined axis is horizontal.
7. A cylinder of 60 mm diameter stands vertically on its base. It is pierced by a horizontal square prism of 35 mm side of base such that the axes of the two solids intersect each other at right angles. A face of the prism is inclined at an angle of 60^0 to HP and 30^0 to VP.
   Draw the projections of the solids, showing the lines of intersection.
8. A square plane with a 60 mm side lies on the GP with the edge nearer to the observer lying in the PP. The station point is 50 mm in front of pp, 60 mm above GP and lies in a CP which is 50 mm towards right of the centre of the object. Draw its perspective view.

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Code :9A03101b

3

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Common to Mechanical Engineering, Electronics & Control Engineering, Computer Science & Systems Engineering)

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

Answer any FIVE questions
All questions carry equal marks
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1. A circle of 60 mm diameter rolls on a horizontal line for a half revolution and then on a vertical line for another half revolution. Draw the curve traced out by a point p on the circumference of the circle.
2. The distance between the projectors of two end of straight line is 40mm. the lower end is 15 mm above HP and 10 mm in front of VP. The upper end is 40 mm above HP and 40 mm in front of VP. Find true length and true inclination.
3. (a) A square ABCD of 50 mm side has its corners A in H.P its diagonal AC is inclined at 30^0 to H.P and the diagonal BD is inclined at 45^0 to V.P and parallel to H.P .Draw its projections.
   (b) A thin 30^0-60^0 set square has its longest edge in V.P and inclined at 30^0 to H.P. Its surface makes an angle of 45^0 with V.P. Draw its projections.
4. (a) A cylinder base 35 mm diameter and axis 60 mm long lies with one of its generators on H.P. such that its axis is parallel to both H.P. & V.P.
   (b) Draw the projections of cube of 40 mm side, resting with a face on H.P. such that one of its vertical faces is inclined at 30^0 to V.P.
5. A cube of 50 mm long edges is resting on the H.P. with a vertical face inclined at 30^0 to the V.P. It is cut by a section plane, perpendicular to the V.P. inclined at 30^0 to the H.P. and passing through a point on the axis, 38 mm above the H.P. Draw the sectional top view, true shape of the section and development of the surface of the remaining portion of the cube.
6. (a) A cylinder of base 50 mm diameter and axis 70 mm long is lying on the H.P. draw its isometric projection when the axis is horizontal.
   (b) Draw the isometric projection of a hexagonal pyramid of side of base 30 mm and height 75 mm , when it is resting on H.P. such that an edge of the base is parallel to V.P.
7. A cylinder of 60 mm diameter and axis 80 mm long is standing on its base on HP. A horizontal rectangular hole of 35 mm x 25 mm sides is cut through the cylinder. Axis of the hole is parallel to VP. The axes of both cylinder and hole intersect at right angles and bisect each other. Draw the projections and show the curves of intersection.
8. Draw a perspective view with a square plane with a 50 mm side which stands vertically on the GP with an edge parallel to and 10 mm behind the PP. The surface of the plane is inclined at 30^0 to PP. The station point is 60 mm in front of PP, 65 mm above GP and lies in a CP hich is 55 mm towards right of the centre of the plane.

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Code :9A03101b 4

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Common to Mechanical Engineering, Electronics & Control Engineering, Computer Science & Systems Engineering)

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

Answer any FIVE questions
All questions carry equal marks
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1. A circle of 50 mm diameter rolls on the circumference of another circle of 175 mm diameter and outside it .trace the locus of a point on the circumference of the rolling circle for one complete revolution. Name the curve draw a tangent and normal to the curve at a point 125 mm from the center of the directing circle.

2. A line PQ 40mm long is parallel to VP and perpendicular to HP. One end Q is 15 mm above HP. Another end P is 55 mm above HP and 25 mm in front of VP. Draw the projections.

3. Draw the projections regular pentagon of 40 mm side, having its surface inclined 30^0 to HP and a side parallel to the HP. And inclined at angle of 60^0 to VP.

4. (a) A hexagonal prism side of base 20 mm and axis 60 mm long lies with one of its rectangular faces on H.P. such that its axis is parallel to both H.P. & V.P.
   (b) A hexagonal pyramid, side of base 25 mm and height 50 mm rests with its base on H.P. such that one of the edges of the base is inclined at 20^0 to V.P. Draw the top and front views of the pyramid.

5. A pentagonal prism, side of base 50 mm and length 100 mm has a rectangular face on the H.P. and the axis parallel to the V.P. It is cut by a vertical section plane, the H.T. of which makes an angle of 30^0 with xy and bisects the axis. Draw the sectional front view, top view and true shape of the section. Develop the surface of the remaining half of the prism.

6. A hexagonal prism , side of base 25 mm and height 50 mm rests on H.P. and one of the edges of its base is parallel to V.P .A section plane perpendicular to V.P. and inclined at 50^0 to H.P. bisects the axis of the prism . Draw the isometric projection of the truncated prism.

7. A cylinder of 60 mm diameter and axis 80 mm long is standing on its base on HP. A horizontal hexagonal hole of 25 mm side is cut through the cylinder. Axis of the hole is parallel to VP. The axes of both cylinder and hole intersect at right angles and bisect each other. A side face of the hole is inclined at an angle of 30^0 to the HP. Draw the projections and show the curves of intersection.

8. A rectangular plane with 60 mm and 40 mm sides is lying in the GP with the longer side parallel to and 15 mm behind the PP. The station point is 50 mm in front of the PP, 60 mm above GP and lies in the CP passing through the centre of the object. Draw its perspective view.

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Code :9A03101c

1

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Computer Science & Engineering)

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

Answer any FIVE questions
All questions carry equal marks
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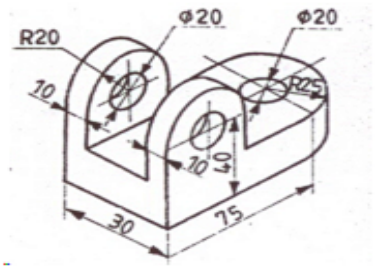
1. (a) A circle of 75 mm diameter rolls on another circle of 115 mm diameter with internal contact. Draw the locus of a point on the circumference of the rolling circle for its one complete revolution.
   (b) Draw the involute of an equilateral triangular of side 20mm.
2. The end A of a line AB is in H.P and 25 behind V.P. The end B is in V.P and 50 above H.P. The distance between the end projectors is 75. Draw the projections of AB and determine its true length, traces and inclinations with the two planes.
3. (a) Draw the projections of a circle of 50 mm diameter resting in the H.P. on a point A on the circumference, its plane inclined at 45^0 to the H.P. and the top view of the diameter AB making 30^0 an angle with the V.P.
   (b) A thin rectangular plate of sides 6omm X 30mm has its shorter side in the V.P. and inclined at 30^0 to the H.P. Project its top view if its front view is a square of 30 mm long sides.
4. A pentagonal pyramid, base 40 mm side and height 75 mm rests on one edge of its base on the ground so that the highest point in the base is 25 mm above the ground. Draw its projections when the axis is parallel to the V.P. Draw another front view on a reference line inclined at 30^0 to the edge on which it is resting, and show that the base is visible.
5. A hollow square prism, base 50 mm side (outside), length 75mm and thickness 9 mm is lying on the h.P. on one of its rectangular faces, with the axis inclined at 30^0 to the V.P. A section plane, parallel to the V.P. cuts the prism, intersecting the axis at a point 25 mm from one of its ends. Draw the top view and sectional front view of the prism.
6. Draw the elevation, plan and left and right side views of the bracket shown in the picture below (dimensions in mm)



7. A square hole of 35 mm side is cut in a cylindrical shaft of 60 mm diameter and 100 mm long. The axis of the hole intersects that of the shaft at right angles. All the faces of the hole are inclined at 45^0 to HP.

   Draw the projections of the shaft when an imaginary plane containing the two axes is parallel to VP.
8. A pentagonal plane with a 30 mm side lies on the GP with an edge parallel to and 20 mm behind the PP. The station point is 50 mm in front of PP, 65 mm above GP and lies in a CP which is at a distance of 40 mm towards right of the centre of the object. Draw its perspective view.

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Code :9A03101c **2**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Computer Science & Engineering)

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

Answer any FIVE questions
All questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. A circle of 50 mm diameter rolls without slipping on the outside of another circle of diameter 150.show the path of a point on the periphery of the (generating) rolling circle, diametrically opposite to the initial point of contact between the circle.

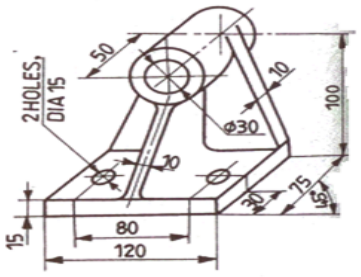
2. (a) Draw the projections of a line LM 40mm long, parallel to HP and inclined at 35^0 to VP. The end L is 20mm above HP and 15mm in front of VP. Find its traces.
   (b) One end R of a straight line RS is 35 mm above HP and 25 mm in front of VP. The other end S is 20 mm below HP and 55 mm behind VP. The distance between the projectors is 50 mm. Determine the true length, inclinations of the line RS and its traces
   (c) A line AB 40 mm long is parallel to VP and inclined at 35^0 to HP. The end A is 15 mm above HP and 20 mm in front of VP. Draw the projections of the line and find its traces.

3. (a) An equilateral triangular plane ABC of side 40 has its plane parallel to V.P. and 20 away from it. Draw its projections of the planes. (i) Perpendicular to H.P. (ii) parallel to H.P. and (iii) inclined to H.P at an angle of 45^0.
   (b) Draw the equilateral triangle of 75 mm side and inscribe a circle in it. Draw the projections of figure , when its plane is vertical and inclined at 30^0 to VP and one of the sides of the triangle is inclined at 45^0 to HP

4. (a) A hexagonal pyramid, side of base 25mm and axis 50mmlong ,rests with one of the edges of its base on H.P and its axis is inclined at 30^0 to H.P and parallel to V.P. Draw its projections.
   (b) A pentagonal prism side of base 25 mm and axis 50 mm long rests with one of its shorter edges on H.P.such that the base containing that edge makes an angle 30^0 to H.P. and its axis is parallel to V.P. Draw its projections.

5. A cylinder, 65 mm diameter and 90 mm long has its axis parallel to the H.P. and inclined at 30^0 to the V.P. It is cut by a vertical section plane in such a way that the true shape of the section is an ellipse having the major axis 75 mm long. Draw its sectional front view and true shape of the section.

6. Convert the bracket shown in the pictorial view below into orthogonal projections of three views.



7. A vertical square prism of side of base 60 mm is penetrated by a horizontal triangular prism of 40 mm side. The axes are 5 mm apart. One rectangular face of the vertical prism is inclined at an angle of 60^0 to VP, while that of the horizontal prism is parallel to VP. Draw the projections showing the lines of intersection.

8. A pentagonal plane with a 30 mm side stands vertically on the GP on an edge and a corner touching the PP. The surface of the plane makes an angle of 30^0 with the PP. The station point is 60 mm in front of PP, 75mm above GP and lies in a CP which is at a distance of 40 mm towards right of the centre of the plane. Draw its perspective view.

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Code :9A03101c

3

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Computer Science & Engineering)

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

Answer any FIVE questions
All questions carry equal marks
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1. A circle of 50 mm diameter , rolls on a horizontal line for half a revolution clockwise and then on a line inclined 60^0 to the horizontal for another half , clockwise , draw the curve traced by point P on the circumference of the circle , taking the top most point on the rolling circle has the initial position of the generating point.

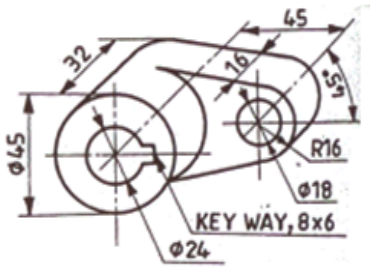
2. (a) Draw the projections of a line CD 30 mm long, parallel to HP and inclined to VP. The end C is 10 mm in front of VP and D is 20 mm in front of VP. The line is 15 mm above HP. Also find the traces.
   (b) A line RS 4o mm long is parallel to both planes. It is 20 mm above HP and 15 mm in front of VP. Draw projections and its traces.

3. (a) A square ABCD of 50mm side has its corner A in the H.P., its diagonal AC inclined at 30^0 to the H.P. and the diagonal BD inclined at 45^0 to the H.P. Draw its projections.
   (b) Draw the projections of a circle of 5 cm diameter, having its plane vertical and inclined at 30^0 to V.P. Its center is 3 cm above the H.P. and 2 cm in front of the V.P.

4. (a) Draw the projections of a regular hexagonal prism, side of base 25 mm and axis 50 mm long resting with its base on H.P. such that one of its edges of the base is inclined at 20^0 to V.P.
   (b) A hexagonal prism ,side of base 25mm and axis 50mm long rests with one of its base makes an angle of 60^0 to H.P .and its axis is parallel to V.P.Draw its projections.

5. A cube of 65 mm long edges has its vertical faces equally inclined to the V.P. it is cut by a section plane, perpendicular to the V.P., so that the true shape of the section is a regular hexagon. Determine the inclination of the cutting plane with the H.P. and draw the sectional top view and true shape of the section.

6. Draw the elevation, plan and left and right side views of the bracket shown below in pictorial view (dimensions in mm)



7. A vertical hexagonal prism, side of base 30 mm and 60 mm long, is completely penetrated by a horizontal square prism of 27 mm side and 90 mm length. The axis of the horizontal prism is parallel to VP and 5 mm in front of the axis of the hexagonal prism.
   If one rectangular face of the hexagonal prism is parallel to VP and all the faces of the square prism are equally inclined to HP, draw the projections of the prisms showing the lines of intersection.

8. A pentagonal plane with a 30 mm side stands vertically on the GP on an edge and a corner touching the PP. The surface of the plane makes an angle of 30^0 with the PP. The station point is 60 mm in front of PP, 75mm above GP and lies in a CP which is at a distance of 40 mm towards right of the centre of the plane. Draw its perspective view.

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Code :9A03101c

4

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Computer Science & Engineering)

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

Answer any FIVE questions
All questions carry equal marks
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1. Construct a hypocycloid rolling circle 50 mm diameter and directing circle 175 mm diameter. Draw a tangent to it at a point 50 mm from the center of the directing circle.

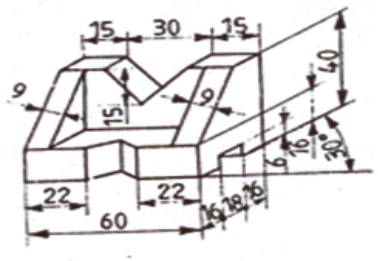
2. (a) The top view of a 75 mm long line CD measures 50 mm. C is 50 mm in front of the V.P. and 15 mm below the H.P. D is 15 mm in front of the V.P. and is above the H.P. Draw the front view of CD and find inclinations with the H.P. and the V.P. Show also its traces.
   (b) A line CD 80 mm long has its end C 55 mm in front of VP and 15 mm above HP. The line is inclined at 50^0 to HP and 40^0 to VP. Draw the projections of the line.

3. The top view of a plate, the surface of which is perpendicular to the V.P. and inclined at 60^0 to the H.P. is a circle of 60 mm diameter. Draw its top view

4. (a) A square pyramid side of base 30mm and height 65mm rests with one of the edges of its base on H.P. such that its base makes 300 to H.P .Draw its projections.
   (b) A pentagonal pyramid ,side of base 25mm and axis 55mm long, lies with one of its slant edges on H.P such that its axis is parallel to V.P. Draw its projections.

5. A vertical hollow cylinder, outside diameter 60 mm, length 85 mm and thickness 9 mm is cut by two section planes which are normal to the V.P. and which intersect each other at the top end of the axis. The planes cut the cylinder on opposite sides of the axis and are inclined at 30^0 and 45^0 respectively to it. Draw the front view sectional top view and auxiliary sectional top views on planes parallel to the respective section planes.

6. Convert the part shown in the pictorial view below into orthogonal projections of three views (dimensions in mm)



7. (a) A right circular cylinder of 60 mm diameter penetrates another cylinder of 80 mm diameter. Their axes are at right angles to each other, but 8 mm apart. Draw the projections of the curves of intersection on a plane parallel to the axes of the cylinders.
   (b) A vertical pipe, 60 mm diameter has a horizontal branch of 40 mm diameter on one side. The axis of the horizontal pipe is 6 mm from the axis of the main pipe and parallel to VP. Draw the projections of the pipe showing the curves of intersection.

8. A hexagonal plane with a 40 mm side has a centrally cut square hole with a 30 mm side such that a side of the hole and a side of the hexagon are parallel PP. It lies on the GP with a nearer edge of the hexagon 10 mm behind the PP. The station point is 50 mm in front of PP, 70 mm above GP and lies in a CP which is at a distance of 40 mm towards right of the centre of the object. Draw its perspective view.

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Code :9A03101d **1**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Electronics & Computer Engineering, Information Technology)

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

Answer any FIVE questions
All questions carry equal marks

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1. Draw a hypo-cycloid of a circle of 40mm diameter , which rolls inside another circle of 160mm diameter, for one revolution counter clockwise. draw a tangent and normal to it at a point 65mm from the center of the directing circle

2. Two mangoes on a tree are 2.0 m and 25 m respectively above the ground and 0.8 m and 1.50m from 0.3m thick compound wall of bungalow, but on the opposite sides of the wall. The distance between the mangoes, measured along the ground and parallel to the wall is 2.0m. Determine the graphically the real distance between the mangoes.

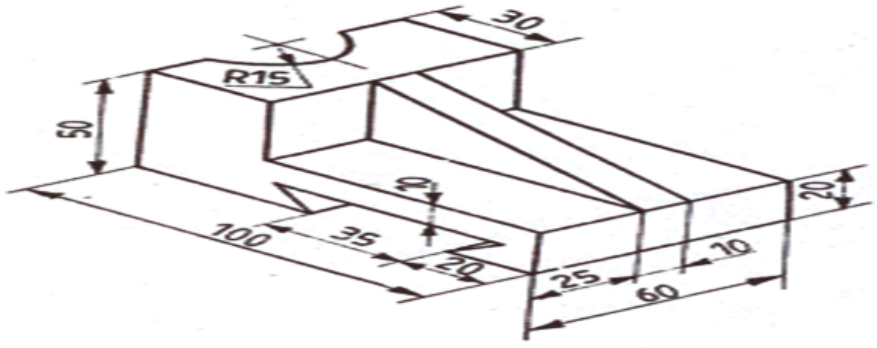
3. A rectangular plane 50x25 size is perpendicular to both H.P. and V.P. The longer edges are parallel to H.P. and then rest one is 20 above it. The shorter edge, nearer to V.P is 15 from it. The plane is 50 from the profile plane. Draw its projections of the plane.

4. (a) A square prism side of base 30mm and axis 50mm long, has an edge of its base in H.P .its axis is inclined at 600 to H.P. and parallel to V.P. Draw its projections.

   (b) A square prism side of base 40mm and axis 60mm long, rests with one of its base corners on H.P .its base makes on angle of 45^0 to H.P and its axis is parallel to V.P. Draw its projections.

5. A square pyramid, base 50 mm side and axis 75 mm long, is resting on the H.P. on one of its triangular faces, the top view of the axis making an angle of 30^0 with the V.P. it is cut by a horizontal section plane, the V.T. of which intersects the axis at a point 6mm from the base. Draw the front view, sectional top view and the development of the sectioned pyramid.

6. Draw the elevation, plan and right views of the bracket shown in the picture below (dimensions in mm)



7. A vertical pipe of 64 mm diameter is welded to an another pipe of diameter 32 mm. The axis of the second pipe is inclined at 60^0 to HP, parallel to VP. Draw the projections showing the curves of intersection.

8. Draw a perspective view of a hexagonal prism having a base with a 40 mm side and a 60 mm long axis, resting on its base in the GP with a side of base parallel to and 10 mm behind the PP. The station point is 50 mm in front of PP, 75 mm above GP and lies in a CP which is 50 mm towards the right of the axis.

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Code :9A03101d

2

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Electronics & Computer Engineering, Information Technology)

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

Answer any FIVE questions
All questions carry equal marks

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1. A circle of 60 mm diameter rolls without slipping on the outside of another circle of diameter 150 mm. Show the path of a point on the periphery of the (generating) rolling circle, diametrically opposite to the initial point of contact between the circle

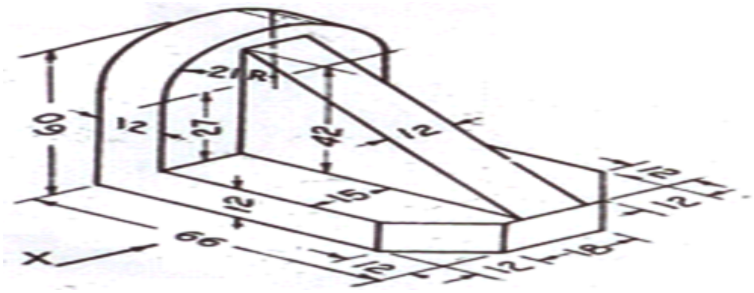
2. A fan is hanging in the center of a room 4 m*4.5 m* 4m high. The center of the fan is 0.6 m below the ceiling. Determine graphically the shortest distance of the fan from one of the corners of the floor.

3. Draw a regular hexagon of 40 mm side, with its two sides vertical. Draw a circle of 40 mm diameter in its center. The figure represents the hexagonal plate with a hole in it and having its surface parallel to the V.P. Draw its projections when the surface is vertical and inclined at 30^0 to the V.P. Assume the thickness of the plate to be equal to that of a line.

4. (a) Draw the projections of a cone, base30mm diameter and axis 50mm long, resting on H.P on a point of its base circle with the axis making an angle of45^0 with H.P and parallel to V.P.
   (b) A hexagonal prism side of base 25 mm and axis 60 mm long, lies with one of its rectangular faces on the H.P. such that the axis is inclined at 45^0 to V.P. Draw its projections.

5. A pentagonal pyramid, base 30 mm side and axis 75mm long has its base horizontal and an edge of the base parallel to the V.P. it is cut by a section plane, perpendicular to the V.P. inclined at 60^0 to the H.P. and bisecting the axis. Draw the front view and the top view when the pyramid is tilted so that it lies on its cut-face on the ground with the axis parallel to the V.P. show the shape of the section by dotted lines. Develop the surface of the truncated pyramid.

6. Draw the elevation, plan and right side view of the part shown in the picture below (dimensions in mm)



7. A vertical square prism, base 50 mm side, has a face inclined at 30^0 to the VP. It has a hole of 65 mm diameter drilled through it. The center line of the hole is parallel to both the HP and the VP and is 5 mm away from the axis of the prism. Draw the projections of the prism and show the curves of intersection.

8. A composite plane is made up of a rectangle with 60 mm and 40 mm sides and a semicircle on its longer side. Draw its perspective view when it is lying in the GP. The longer side is perpendicular to PP and the shorter side is 10 mm behind it. The station point is 50 mm in front of the PP, 60 mm above the GP and lies in the CP which is 50 mm to the right of the centre of the semicircle.

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Code :9A03101d **3**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Electronics & Computer Engineering, Information Technology)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Draw an epi-cycloid if a circle of 40 mm diameter rolls outside another circle of 120 mm diameter for one revolution.
   (b) A circle of 40mm diameter rolls on the concave side of another circle of 40mm radius. Draw the path traced by a point on the generating circle for one complete revolution.

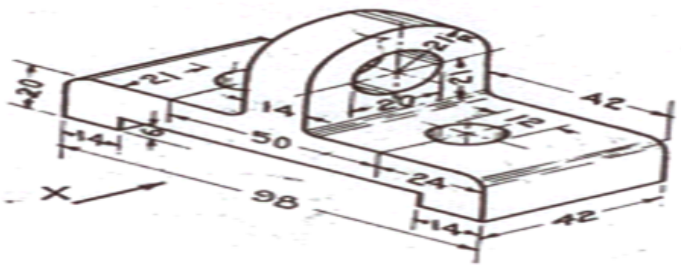
2. Two apples A and B an apple tree are 3m and 2 m respectively above the ground. apple A is 0.8m and 1.2m from the adjacent compound walls P and Q respectively while the corresponding distances of the apple B are 4m and 8m .draw the projections of apples if the two walls are at right to each other . Find the true distance between the two apples.

3. Draw the projections of a rhombus having diagonals 125 mm and 50 mm long, the smaller diagonal of which is parallel to both the principal planes, while the other is inclined at 30^0 to the H.P.

4. (a) Draw the projections of a cube of 30mm edge ,resting in the H.P .on one of its corners with a solid diagonal parallel to both H.P and V.P.
   (b) A cone of base 50mm diameter and axis 65mm long, lies with one of its generators on H.P and its axis parallel to V.P Draw its projections.

5. A tetrahedron of 65 mm long edges is lying on the H.P. on one of its faces, with an edge perpendicular to the V.P. it is cut by a section plane which is perpendicular to the V.P. so that the true shape of the section is an isosceles triangle of base 50 mm long and altitude 40 mm. Find the inclination of the section plane with the H.P. and draw the front view, sectional top view and the true shape of the section.

6. Draw the elevation, plan and right side view of the bracket shown in the picture below (dimensions in mm)



7. A vertical cylinder of 60 mm diameter is penetrated by a square prism of 35 mm side. The axis of the prism is inclined at an angle of 30^0 to the ground, but parallel to the VP. The faces of the prism are equally inclined to the VP and the axis of the prism is 10mm in front of the axis of the cylinder.
   Draw the projections of the solids showing the curves of interpenetration.

8. Draw a perspective view of a pyramid having base with a 40 mm side and a 60 mm long axis, resting on its base in the GP with its axis at a distance of 40 mm behind the PP and all the edges of the base equally inclined to it. The station point is 50 mm in front of PP, 75 mm above GP and lies in a CP which is 50 mm towards right of the axis.

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Code :9A03101d

4

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Electronics & Computer Engineering, Information Technology)

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

Answer any FIVE questions
All questions carry equal marks

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1. Draw the epi cycloid and hypo cycloid when the generating circle and the directing circle are of 50 mm and 175 mm diameters respectively.

2. A line AB measuring 85 mm has its end A 25 mm above HP and 20 mm in front of VP. The front and top views of the line measure 70 mm and 55 mm respectively. Draw the projections of the line and determine its true lengths.

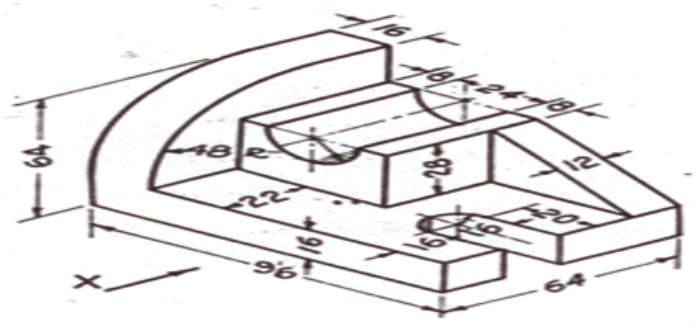
3. A semi-circular plate of 80mm diameter has its straight edge in the V.P. and inclined at 45^0 to the H.P. The surface of the plate makes an angle of 30^0 with the V.P. Draw its projections

4. (a) A cone base 40 mm diameter and axis 50 mm long, touches the V.P. on a point of its base circle. Its axis is inclined at 30^0 to V.P.and parallel to H.P. Draw its projections

   (b) A pentagonal prism, side of base 25mm and axis 65mm long, rests with one of the edges of its base on H.P. Its axis is inclined 30^0 to H.P and parallel to V.P. Draw its projections.

5. A hexagonal pyramid, base 50 mm side and axis 100 mm long, is lying on the H.P. on one of its triangular faces with the axis parallel to the V.P. A vertical section plane the H.T. of which makes an angle of 30^0 with the reference line, passes through the centre of the base and cuts the pyramid, the apex being retained. Draw the top view, sectional front view, true shape of the section and the development of the surface of the cut-pyramid.

6. Draw the elevation, plan and left and right views of the bracket shown in the picture below (dimensions in mm)



7. A right circular cone of base 50 mm and altitude 80 mm standing on HP with its axis vertical is penetrated by a cylinder of diameter 20 mm such that the axes intersect at an angle of 60^0 at a height of 35 mm from the base and the plane containing the axes is parallel to VP. Draw the curves of intersection.

8. A pentagonal prism having base with a 40 mm and a 60 mm long axis lies on its base in the GP with a face parallel to and 15 mm behind the PP. The station point lies in a Cp which is 50 mm towards right of the axis, 65 mm in front of PP and 80 mm above GP. Draw its perspective view.

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Code :9A03101e

1

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Electronics & Communication Engineering)

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

Answer any FIVE questions
All questions carry equal marks
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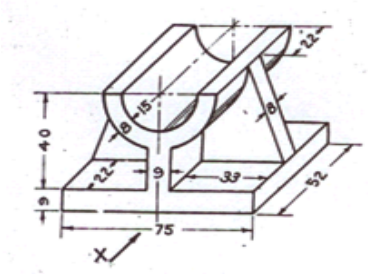
1. (a) Draw a hypo-cycloid of a circle of 40 mm diameter, which rolls inside another circle of 160mm diameter, for one revolution counter clockwise.
   (b) Draw the involute of a regular hexagon of side 20 mm. Draw a tangent and normal to the curve at a distance of 100 mm from the center of the hexagon.
2. An Ornamental light O is placed 10 m above the floor and in the center of an auditorium 40m* 50 m* 35 m high. Determine graphically its distance from one of the corners between the roof and two adjacent walls.
3. A regular hexagon of 40 mm side has a corner in the HP. Its surface is inclined at 45^0 to HP and the top view of the diagonal through the corner which is in the HP makes an angle of 60^0 with the VP. Draw its projections.
4. A square prism, side of base 30 mm and axis 45 mm long lies on H.P. such that its axis is parallel to both H.P. & V.P., Draw the top and front views of the prism when (i) its lies with one of its rectangular faces on H.P. and (ii) it lies with one of its longer edges on H.P.
5. A cone, base 75 mm diameter and axis 75 mm long, has its axis parallel to the V.P. and inclined at 45^0 to the H.P. A horizontal section plane cuts the cone through the mid-point of the axis. Draw the front view, sectional top view and an auxiliary top view on a plane parallel to the axis.
6. Draw the front view, top view and right side view of the object shown below.



7. A hexagonal prism, having base with a 40 mm side and a 100 mm long axis, is resting on its base on the H.P. with a side of the base parallel to the V.P. It is penetrated by a square prism having base with a 35 mm side and a 100 mm long axis such that the axes of both the prism intersect each other at right angles. The faces of the square prism is equally inclined to the H.P. Draw the projections of the combination and show the lines of intersection.
8. A pentagonal pyramid having a base with a 40 mm side and a 60 mm height rests on the GP with an edge of the base parallel to and 10 mm behind the PP. The station point is 75 mm above the GP and 60 mm in front of the PP and lies in a CP which is 40 mm towards the right of the axis of the pyramid. Draw its perspective projection.

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Code :9A03101e

2

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Electronics & Communication Engineering)

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

Answer any FIVE questions
All questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. Draw the path traced out by a point on a circumference of circle when it rolls, without slip, on vertical surface, for the distance equal to the perimeter of the circle of diameter of 40 mm.

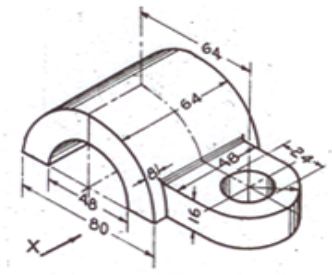
2. An electric bulb is hung vertically from the center of a terraced room at a height of 0.5 m below the ceiling. The room measures 5 m long, 4m wide and 3 m high. Determine graphically the true distance between the bulb and any one of the corners below.

3. A rectangular plane of size 60 X 30 has its shorter side on H.P and inclined at 30^0 to V.P. Draw the projections of the plane. If its surface is inclined at 45^0 to the H.P.

4. A pentagonal pyramid of edge of base 30 mm and length of axis 65 mm is resting on a corner of the base on the HP. The triangular face opposite to the corner on the HP is inclined to the HP at 45^0 with its shorter edge inclined to the VP at 60^0.Draw its projections.

5. A hexagonal prism, side of the base 25 mm long and axis 65 mm long is resting on an edge of the base on the H.P. its axis being inclined at 60^0 to the H.P. and parallel to the V.P. A section plane, inclined at 45^0 to the V.P. and normal to the H.P. cuts the prism and passes through a point on the axis at a distance of 20 mm from the top end of the axis. Draw its sectional front view and true shape of the section.

6. Draw the elevation, plan and left and right side views of the bracket shown in the picture below (dimensions in mm).



7. A pentagonal prism, having base with a 45 mm side and a 100 mm long axis, is resting on its base on the H.P. with a side of the base parallel to the V.P. It is penetrated by a square prism having base with a 35 mm side and a 100 mm long axis, such that the axes of both the prism bisect each other at right angles. The faces of the square prim are equally inclined to the H.P. Draw the projections of the combination and show the lines of intersection.

8. A square prism having base with a 40 mm side and 60 mm long axis is resting on its rectangular face on the GP with axis inclined at 45^0 to PP. A side of base nearer to the PP is 20 mm behind it and 20 mm to the left of the station point. The station point is 80 mm in front of PP and 70 mm above GP. Draw its perspective view.

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Code :9A03101e

3

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Electronics & Communication Engineering)

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

Answer any FIVE questions
All questions carry equal marks
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1. (a) A circle of diameter 40 mm rolls inside another circle of radius 60 mm. draw the hypo cycloid traced by a point on the rolling circle initially in contact with the directing circle for one revolution.
   (b) A circle of 50 mm diameter rolls along a line for one revolution clock-wise. Draw the locus of the point on the circle, which is in contact with the line.

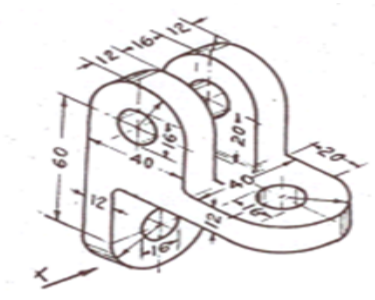
2. (a) A point M is 35 mm above HP and 40 mm in front of VP .draw its projections .
   (b) A point B is 45 mm above HP and 60 mm behind VP. draw the projections
   (c) Draw the projections of a point B lying on HP and 55 mm in front of VP.
   (d) A point M is 60 mm below HP and 45mm in front of VP. draw the projections

3. (a) A triangular lamina of 50 mm side , is standing on one of its sides, which is inclined 45^0 to VP and surface of the lamina is making an angle of 30^0 to HP .Draw its projections.
   (b) A regular pentagonal plate of side 28 mm is placed with one side on HP such that the surface is inclined at 45^0 to HP and perpendicular to VP. Draw its projections.

4. (a) Draw the projections of a cone, base 75 mm diameter and axis 100 mm long, lying on one of its generators with parallel to the V.P.
   (b) A tetrahedron of 5 cm long edges is resting on the H.P. on one of its faces, with an edge of that face parallel to the V.P. Draw its projections and measure the distance of its apex from the ground

5. A pentagonal pyramid, edge of base 25 mm long and height 50 mm is resting on the H.P. on a corner of its base in such a way that the slant edge containing that corner makes an angle of 60^0 with the H.P. and is parallel to the V.P. it is cut by a section plane making an angle of 30^0 with the V.P. perpendicular to the H.P. and passing through a point on the axis at a distance of 6 mm from its base. Draw its sectional front view and true shape of the section.

6. Draw the elevation, plan and left and right side views of the bracket shown in the picture below (dimensions in mm).



7. A square prism, having base with a 50 mm side, is resting on its base on H.P. with the faces equally inclined to the V.P. It is completely penetrated by a horizontal cylinder with a 50 mm base diameter such that their axes of bisect each other at right angles. Assuming suitable lengths of both the solids, draw their projections and show the curves of intersection.

8. A hexagonal prism having 30 mm base side and 70 mm long axis is resting on its face in the GP with the axis inclined at 30^0 to the PP. The station point is 90 mm in front of PP, 100 mm above the GP and lies in the CP which is 70 mm rightwards to the corner nearer to the PP. Draw a perspective view when the corner nearer the observer touches the PP.

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Code :9A03101e

4

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
ENGINEERING DRAWING
(Electronics & Communication Engineering)

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

Answer any FIVE questions
All questions carry equal marks
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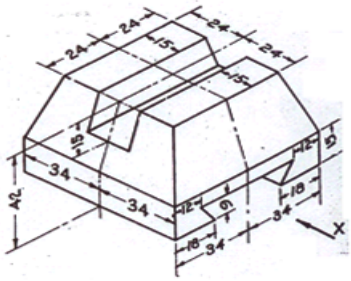
1. (a) Draw the involute of an equilateral triangular of side 20mm.
   (b) A tread of length 165mm is wound round a circle of 40mm diameter. Trace the path of end point of the tread.
2. (a) Draw the projections of a point A lying on HP and 50 mm in front of VP.
   (b) Draw the projections of a point A lying on VP and 55 mm above HP.
   (c) A point D is 35 mm below HP and 35 mm behind VP. draw the projections
   (d) A point S is 35mm above HP and 55mm behind VP. draw the projections
3. (a) A square plane ABCD of side 30 is parallel to H.P.and 20 away from it. Draw its projections of the plane. (i)parallel to V.P. (ii) inclined at 30^0 to V.P.
   (b) A regular pentagon of 30 mm side, has one of its corner on VP and Its surface is inclined at 60^0 to VP .The edge, opposite to corner on VP, makes an angle of 45^0 with HP .draw the projections of the plane.
4. (a) Draw the projections of a cylinder 75 mm diameter and 100 mm long, lying on the ground with its axis inclined at 30^0 to the V.P. and parallel to the ground.
   (b) A triangular prism base 40 mm side and height 65 mm is resting on the H.P. on one of its rectangular faces with the axis parallel to the V.P. Draw its projections
5. The distance between the opposite parallel faces of a 50 mm thick hexagonal block is 75 mm. The block has one of its rectangular faces parallel to the H.P. and its axis makes an angle of 30^0 with the V.P. It is cut by a section plane making an angle of 30^0 with the H.P., normal to the V.P. and bisecting the axis. Draw its sectional top view and another top view on a plane parallel to the section.
6. Draw the front view, top view and left side view of the object shown below (dimensions in mm).



7. A square prism, having base with a 60 mm side and a 100 mm long axis, is resting on its base on H.P. with the faces equally inclined to the V.P. It is completely penetrated by a hexagonal prism having base with a 30 mm side and a 100 mm long axis having a face parallel to H.P. The axes of the prisms bisect each other at right angles. Draw their projections and show the curves of intersection.
8. A cylinder with a 40 mm base diameter and 50 mm long axis rests on the GP with its axis parallel to and 30 mm behind the PP. The station point is 80mm above the ground and at a distance of 50 mm in front of the PP and lies in the CP which passes through the axis of the cylinder. Draw its perspective projection.

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Code :9A05101 **1**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
PROGRAMMING IN C AND DATA STRUCTURES
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. Explain the three categories of statements for Algorithm Development with examples.
2. (a) What is a comment . Write the syntax for writing comments in C. What are the guide lines followed while writing comments?
   (b) Explain the general form of a C program with an example.
3. (a) Explain about call by reference with an example.
   (b) What is recursion? What are the advantages and disadvantages of recursion?
4. (a) Explain the concept of pointer to pointers with examples.
   (b) Explain the concept of void pointers with examples.
5. (a) Write a program in C to display the size of structure elements using size of operator?
   (b) Explain the different ways of defining the structure and how to access the structure members with examples?
6. Write a C program that uses fseek () function to alter the file pointer in multiples of 2 and copy those contents into a new file.
7. (a) Explain the various operations on a stack.
   (b) Write a program implementing stack.
8. (a) Why quick sort is said to be the most efficient sorting method? Discuss with example.
   (b) Write a program in C to perform quick sort in a given list of integers.

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Code :9A05101 **2**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
PROGRAMMING IN C AND DATA STRUCTURES
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. With a neat diagram explain the role of the compiler in the process of developing and testing a high level language program?
2. What is an operator? Explain different operators in C.
3. What is an array? What are the advantages of arrays over a ordinary variables? How arrays are declared and initialized ?
4. Explain various dynamic memory allocation functions with examples.
5. Write a program in C that represents the details of an employee using structure and also uses structures within structure to represent his pay details. The program should define two functions one for reading the data and one for displaying the data?
6. Write a C program that displays the attributes of a file.
7. (a) List the applications of stack.
   (b) Explain the procedure to convert infix to postfix using stack.
8. (a) Apply insertion sort to the list of integers found in a file. Write the sorted output to the file.
   (b) Justify the fact that the efficiency of quick sort is O(logn) under best case.

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Code :9A05101 **3**

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
PROGRAMMING IN C AND DATA STRUCTURES
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Explain the advantages and disadvantages of using high level languages over machine level languages.
   (b) What is in Integrated Development Environment(IDE).Explain its features.
2. (a) What are bitwise operators in C? Write a c program to shift input data by two bits right.
   (b) What is a token? Explain different C tokens.
3. (a) Write a program to find the product of all the elements in an array?
   (b) How is a multidimensional array declared and initialized?
4. Explain any seven string handling functions with examples.
5. (a) How to use arrays as structure members. Illustrate with example?
   (b) How to use indirection notation and selection notation to access the members of structure with an example?
6. Write a program in C that reverses the contents of a file and copies it into a new file.
7. Discuss searching operations with singly linked list.
8. (a) Define sequential searching method.
   (b) Write a program in C using functions to perform selection sort in a given list of integers.

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Code :9A05101 4

B.Tech I Year (R09) Regular & Supplementary Examinations, May/June 2011
PROGRAMMING IN C AND DATA STRUCTURES
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) What is main memory? Explain two types of main memory?
   (b) What is an input device? Mention at least five input devices.
2. With examples explain different decision statements in C?
3. (a) Distinguish between call by value and call by reference.
   (b) Write a program to find the sum of all elements in an array.
4. (a) Explain declaration and initialization of arrays of strings.
   (b) Write a C program to find whether a given string is palindrome or not.
5. (a) How to store the address of structure variable. Explain with example?
   (b) Write a program in C to declare structure variable book containing the members name, author and pages and display the contents of the structure by using a pointer to the structure.
6. (a) Write a program in C that converts the contents of a file in to capital letters.
   (b) Write a C program that sorts the contents of a file containing a list of students' names.
7. (a) Write the algorithm to convert infix expression to postfix.
   (b) Explain infix and prefix notations of representing expressions.
8. (a) Write a program in C using functions to apply merge sort to the given arrays of integers.
   (b) Discuss linear search algorithmic technique with an example.

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Code No: 9ABS101 **1**

I Year B.Tech(R09) Regular & Supplementary Examinations, May/June 2011.
ENGLISH
(Common to all branches)

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

(Answer FIVE questions in total with at least ONE question from Part-B)
(All questions carry equal marks)

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PART-A

1. "Inevitably, Ladakh is something of a test case of what good as well as bad can be brought by travelers." Elaborate.
2. (a) The day when Raman walked into the IACS was a historic moment. Give reasons to support this.
   (b) Give an account of C.V Raman's work at the University of Calcutta.
3. Amartya Sen is known in India as the Mother Teresa of Economics. He spent his life time fighting poverty with analysis rather than activism -elaborate this statement by comparing his work with that of the Mother.
4. Gender discrimination hampers the progress of women. How did Gertrude overcome this in her life?
5. (a) Why did the author enter the arti-goth patch?
   (b) Describe the priest of Arti-goth. Why did the villagers stone the priest.
6. (a) Give an account of Charles Chaplin's childhood.
   (b) How did Charles start his career?

PART-B

7. A committee was appointed to look into the complaints of serious financial irregularities in a branch office. As the convenor of the committee, draft your report to the general manager pointing about the problem and suggesting the actions to be taken.
8. Correct The Following Sentences:
   (a) It was warm so I 'm taking off my coat.
   (b) It did not rained yesterday.
   (c) We played Tennis tomorrow.
   (d) Physics were my best subject at school.
   (e) I can't find my binoculars. Do you know where it is?
   (f) The committee haven't made a decision yet.
   (g) This scissors isn't very sharp.
   (h) I am going to buy a new pyjama.
   (i) Julia had a great holiday. She enjoyed themselves.
   (j) If there are some letters for me, can you send them on to this address.
   (k) Let me know if you need something.
   (l) I am hungry. I want anything to eat.
   (m) I am getting up at 8 o' clock every morning.
   (n) I have seen Tom yesterday.

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Code No: 9ABS101 **2**

I Year B.Tech(R09) Regular & Supplementary Examinations, May/June 2011.
ENGLISH
(Common to all branches)

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

(Answer FIVE questions in total with at least ONE question from Part-B)
(All questions carry equal marks)

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PART-A

1. (a) "When I look at Leh at this moment, there is no individual thinking of a plan. It's all very chaotic," says Namgyal, the son of the last king of Ladakh. How far is it true with the developments in Ladakh?
   (b) The Tse-Chu festival is one of the great events of the Ladakhi calendar. How is it celebrated?
2. (a) Give an account of C.V.Raman's early life and education.
   (b) Raman was fascinated by musical sounds. Write about his research done on musical instruments.
3. (a) How did Shantiniketan mould the mind of Amartya Sen in his childhood?
   (b) What was the change that he experienced as a teenager?
4. A school girl researched scientists on the internet and selected Gertrude as her heroine. Do you think Gertrude deserves it?
5. (a) Who went along with the writer into the grass patch and why.
   (b) What did the writer see when he pushed his way through a thick clump of grass?
6. How did Chaplin become world famous?

PART-B

7. (a) Write a letter to the principal of your college to arrange for a reading room in the library and also arrange for sports and games.
   (b) Write a letter to your brother congratulating him on getting the first prize In the science talent search examination.
8. Correct The Following Sentences:
   (a) She went out without some money.
   (b) You can take some bus. They all go to the centre.
   (c) If somebody wants to leave early, they can.
   (d) 'Can I ask you anything?' 'Sure. What do you want to ask?'
   (e) What bus do I have to catch?
   (f) Gary is very busy with his job. He has few time for other things.
   (g) I enjoy my life here. I have few friends and we meet quite often.
   (h) He spoke little English, so we were able to communicate with him.
   (i) We spent much money.
   (j) Let's go and have coffee. We have little time before the train leaves.
   (k) Vicky has very little friends in London.
   (l) She's lucky. She has some problems.
   (m) The village was very small. There were only few houses.
   (n) Neither restaurant are expensive.

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Code No: 9ABS101 **3**

I Year B.Tech(R09) Regular & Supplementary Examinations, May/June 2011.
ENGLISH
(Common to all branches)

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

(Answer FIVE questions in total with at least ONE question from Part-B)
(All questions carry equal marks)

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PART-A

1. (a) The writer had read of the way people live in Ladakh before he went there .What did he discover to his surprise on reaching Ladakh?
   (b) The visit of travelers definitely has affected the environment and the tradition of Ladakh but Helena Norberg-Hodge is committed to protect the apparently self -sustaining traditional world .What is her service to Ladakh?
2. (a) Write about Raman's childhood and education.
   (b) Provide a note on his work on waves and light.
3. An incident during his young days at Dhaka was the basis on which Amartya's research and analysis in economics were to be formed. How did it lead to his research?
4. The world waits for none. Gertrude realized this and paved the way for her future and proved herself a successful chemist. Explain.
5. (a) Describe the patch of jungle grass.
   (b) What was the priest's reaction when the writer suddenly appeared at his hut?
6. Describe Chaplin as a legend.

PART-B

7. Bharat Textile Mill, Kanpur, manufactures several kinds of cotton and synthetic clothes. For the last five years, there has been a gradual decline in profits owing to various causes, including fall in sales. The Managing Director has asked the marketing manager to investigate the causes, make suitable recommendations, and submit a report. Assuming yourself to be the Marketing Manager, prepare a report.
8. Correct The Following Sentences:
   (a) Both of these restaurants is very good.
   (b) Both Chris and Pat was late.
   (c) There are two good hotels herre. You can stay at neither of them.
   (d) Neither Chris and Pat came to the party.
   (e) I was invited to two parties last week, but I could go to none.
   (f) We tried a lot of hotels, but neither of them had any rooms.
   (g) John and I could n't get into the house because none of us had a key.
   (h) It was a terrible fire. Whole building was destroyed.
   (i) Everybody have arrived.
   (j) I don't like stories who have unhappy endings
   (k) Do you know the person that took the photographs?
   (l) what was the name of the horse it won the race?
   (m) The woman lives next door is a doctor.
   (n) The people we met last night was very nice.

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Code No: 9ABS101 **4**

I Year B.Tech(R09) Regular & Supplementary Examinations, May/June 2011.
ENGLISH
(Common to all branches)

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

(Answer FIVE questions in total with at least ONE question from Part-B)
(All questions carry equal marks)

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PART-A

1. While young people in Ladakh's towns prefer western ways of entertainment, people in rural areas continue to enjoy their old, local forms of music and sports. How do you think that westernization has affected the originality of Ladakh?
2. Elucidate Raman's work on:
   (a) Acoustics.
   (b) Optics.
3. (a) Give an account of Amartya Sen's education , with in the country and abroad.
   (b) What were the competing political demands that caused a dilemma in Sen?
4. (a) As a woman Gertrude faced many hardships in her education and career. Explain.
   (b) How does Jon Elion recall Gertrude's memories?
5. Why did the author devoutly wish that he should have left the big boar alone?
6. Give an account of the various films that Chaplin acted in.

PART-B

7. (a) Write a letter to the commissioner of the local municipality about the menace of street dogs and the need to take measures to sterilize them.
   (b) Write a letter to your friends living in the USA accepting an invitation to his brother's wedding. Inventing relevant names and dates, etc., give details of your programme of arrival.
8. Correct The Following Sentences:
   (a) What's the best thing it has ever happened to you.
   (b) What happened to money it was on the table.
   (c) The people work in the office are very nice.I'm surprised.
   (d) dolly is only 25. I thought she was elder.
   (e) You English is improving. It's getting good.
   (f) The more electricity you use, the high you bill will beThe hotel is cheapest in town.
   (g) Yesterday was the hot day of the year.
   (h) This hotel is cheap than all the others in town.
   (i) She is a really nice person.-one of the nice people I know.
   (j) I ate quickly my breakfast and went out.
   (k) Are you going to invite to the party a lot of people?
   (l) Did you go last night late to bed.
   (m) Joe didn't like very much football.
   (n) I met on my way home a friend of mine.

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Code No: 9ABS102 **1**

I Year B.Tech(R09) Regular & Supplementary Examinations, May/June 2011.
ENGINEERING PHYSICS
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Explain what is meant by diffraction of light. How diffraction is different from interference?
   (b) Discuss Fraunhofer single slit diffraction. Draw intensity distribution curves and give conditions for bright and dark fringes in single slit diffraction pattern.
2. (a) State and explain Bragg's law.
   (b) What are Miller Indices? Draw (1 1 1) and (1 1 0) planes in a cubic lattice.
   (c) Calculate the interplanar spacing for (3 2 1) planes in a simple cubic crystal whose lattice constant is 4.2 A.U.
3. (a) Explain the concept of matter waves.
   (b) Derive the expression for de Broglie wavelength.
   (c) Explain the consequences of uncertainty principle.
4. (a) Derive the diode equation.
   (b) Write notes on LED and Photo Diode.
5. (a) What are the properties of paramagnetic materials?
   (b) Discuss the temperature variation of susceptibility in paramagnetic Material by deriving the relation between them.
6. (a) What is penetration depth of a magnetic field on a superconductor And discuss its variation with the temperature.
   (b) Describe the significance of penetration depth on superconductor.
7. (a) Describe the function of single mode step index optical fiber along With its refractive index profile.
   (b) Explain why step index optical fiber is of reflective type.
8. (a) Explain the Vibrational properties exhibited by Carbon Nanotubes.
   (b) Explain the basic factors of Carbon Nanotubes on which its Vibrational Properties depend.

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Code No: 9ABS102 **2**

I Year B.Tech(R09) Regular & Supplementary Examinations, May/June 2011.
ENGINEERING PHYSICS
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) What are the types of diffractions and give the differences between them.
   (b) Obtain the condition for primary maxima in Fraunhofer diffraction due to single slit and derive an expression for width of the central maxima.
2. (a) What are Miller indices? How are they obtained?
   (b) Deduce the expression for the inter planar distance in terms of Miller indices for a cubic system.
   (c) Copper has FCC structure and the atomic radius is 0.1278 nm. Calculate the inter planar spacing for (1 1 0) and (2 1 2) planes.
3. (a) Explain the de Broglie hypothesis.
   (b) State and explain uncertainty principle.
   (c) Using uncertainty principle, explain the absence of electrons in the nucleus.
4. (a) State and explain Hall effect.
   (b) Explain the working of LED and Photo Diode.
5. (a) Discuss ferromagnetism in the case of ferromagnetic materials.
   (b) Explain the important features of ferromagnetism.
6. How are the superconductors are classified and describe the behavior Of each type in the presence of magnetic field.
7. (a) Explain why graded index optical fiber is of refractive type.
   (b) Explain the advantages of graded index optical fiber when Compared to step index optical fiber.
8. (a) How the Physical and chemical properties of Nanomaterials vary With their size.
   (b) Write the important applications of Nanomaterials.

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Code No: 9ABS102 **3**

I Year B.Tech(R09) Regular & Supplementary Examinations, May/June 2011.
ENGINEERING PHYSICS
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Differentiate between interference and diffraction.
   (b) Give the theory of Fraunhofer diffraction due to a double slit and compare the results with that due to single slit.
2. (a) State and explain Bragg's law.
   (b) Describe with suitable diagram, the powder method of determination of crystal structure.
   (c) Monochromatic X-rays of wavelength 1.5 A.U. are incident on a crystal face having an inter planar spacing of 1.6 A.U. find the highest order for which Bragg's reflection maximum can be seen.
3. (a) State and explain uncertainty principle.
   (b) Show that the energies of a particle in a potential box are quantized.
4. (a) Derive the continuity equation for electrons.
   (b) Write notes on p-n junction.
5. (a) Explain the salient features of antiferro magnetic materials.
   (b) Explain the phenomenon of spontaneous magnetization in ferromagnetic Materials.
6. (a) Explain the importance of population inversion in emission of laser beam.
   (b) Describe various methods of achieving population inversion.
7. (a) Describe the function of multi mode step index optical fiber along With its refractive index profile.
   (b) Distinguish between single mode and multi mode step index Optical fibers.
8. (a) Mention the important applications of Carbon Nanotubes in Computer field.
   (b) Explain the usage of Carbon Nanotubes as fuel cells in batteries.

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Code No: 9ABS102 **4**

I Year B.Tech(R09) Regular & Supplementary Examinations, May/June 2011.
ENGINEERING PHYSICS
(Common to all branches)

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

Answer any FIVE questions
All questions carry equal marks

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1. (a) Explain with necessary theory, the Fraunhofer diffraction due to 'n' slits.
   (b) Calculate the maximum number of orders possible for a plane diffraction grating.
2. (a) Define Coordination Number, Nearest Neighbor Distance, Atomic Radius and Packing Fraction.
   (b) Explain the powder method of crystal structure analysis.
   (c) The Bragg's angle for reflection from the (1 1 1) plane in a FCC crystal is 19.2^0 for an X-ray of wavelength 1.54 A.U. Compute the cube edge of the unit cell.
3. (a) Explain the Fermi-Dirac distribution function of electrons. Explain the effect of temperature on the distribution.
   (b) Write notes on source of electrical resistance.
4. (a) State and explain Hall effect.
   (b) Explain the experiment to determine the Hall coefficient.
5. (a) Discuss the characteristic features of ferromagnetic materials.
   (b) Discuss the spin arrangements in ferromagnetic, ferrimagnetic and Antiferromagnetic materials.
6. (a) Explain the important components of laser device.
   (b) What do you understand by population inversion and how it is achieved?
7. (a) Describe the construction of a typical optical fiber along with the Dimensions of the various parts.
   (b) What is total internal reflection? Discuss its importance in Optical fiber.
8. (a) Explain the sensor and catalyst applications of Carbon Nanotubes.
   (b) Mention the important applications of Carbon Nanotubes in Material technology.

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