2012 – 2013
B.TECH. AUTUMN (III SEMESTER) EXAMINATION
(ELECTRONICS ENGINEERING)
HIGHER MATHEMATICS - I
(AM-251)
Credits: 04

Max. Marks: 60

Note: Answer all questions.

1. (a) A particle moves on the curve \( x = 2t^2, y = t^2 - 4t, z = 3t - 5 \) where \( t \) is the time. Find the components of velocity and acceleration at time \( t = 1 \) in the direction \( \hat{L} - 3\hat{j} + 2\hat{k} \).

(b) Find the directional derivative of \( \phi = (x^2 + y^2 + z^2)^{1/2} \) at the point \((3, 1, 2)\) in the direction of the outer normal to the surface \( x^2 + y^2 + z^2 = 6 \) at the point \((1, 2, -1)\).

OR

2. (a) A fluid motion is given by
\[
\vec{v} = (y + z)\hat{i} + (x + z)\hat{j} + (x + y)\hat{k}
\]

(i) Is this motion irrotational? If so find the velocity potential.

(ii) Is the motion possible for an incompressible fluid?

(c) If \( \vec{A} \) and \( \vec{B} \) are irrotational, prove that \( \vec{A} \times \vec{B} \) is solenoidal.

2. (a) Show that \( \vec{F} = (2xy + z)\hat{i} + x^2\hat{j} + 3z^2x\hat{k} \) is a conservative field. Find its scalar potential and also the work done in moving a particle from \((1, -2, 1)\) to \((3, 1, 4)\).

OR

(a') Use Green’s theorem in a plane to evaluate the integral
\[
\int \left( 2x^2 - y^2 \right) dx + \left( x^2 + y^2 \right) dy
\]
Where C is the boundary of the surface in the xy-plane enclosed by the x-axis and the semi-circle \( y = \sqrt{1 - x^2} \).

(b) Verify stoke’s theorem for \( \vec{F} = x^2\hat{i} + xy\hat{j} \) in the square region in the XOY plane bounded by the lines \( x = 0, y = 0, x = a, y = a \).

(c) Use divergence theorem to evaluate the surface integral \( \iiint \vec{F} \cdot d\vec{S} \) where
\[
\vec{F} = 4x\hat{i} - 2y^2\hat{j} + z^2\hat{k}
\]
and \( S \) is the surface bounding the region \( x^2 + y^2 = 4, z = 0, z = 3 \).

3. (a) Evaluate any two of the following

(i) \( L \left( \frac{1 - \cos t}{t} \right) \), (ii) \( L^{-1} \left( \cot \frac{t}{2} \frac{s}{k} \right) \)
(iii) \( L^{-1}\left[\frac{s^2}{(s^2 + a^2)(s^2 + b^2)}\right] \) by convolution theorem where \( L \) & \( L^{-1} \) denote Laplace transform and its inverse respectively.

(b) Solve the D.E. \( y''(t) + 9y(t) = 18 \) by Laplace transform method given that \( Y(0) = 0 \) & \( y\left(\frac{\pi}{2}\right) \).

(c) The current \( i \) and the charge \( q \) in a series circuit containing an inductance \( L \), a capacitance \( C \) and an e.m.f. \( E \) satisfy the equations:
\[
L \frac{di}{dt} + \frac{q}{C} = E, \quad i = \frac{dq}{dt}
\]
Using Laplace transform method express \( i \) and \( q \) in terms of time \( t \) given that \( I, C, E \) are constants and that the initial values of \( i \) and \( q \) are both zero.

OR

(c') Obtain the Laplace Transform of the periodic sawtooth wave represented in the figure below:

![Sawtooth Wave Diagram]

4. Answer any three of the following:

(a) The probability that a man aged 60 will live to be 70 is 0.65. What is the probability that out of 10 men, now 60, at least 7 will live to be 70?

(b) Suppose a sample of 10 is taken from a days out put of a machine that normally produces 5 percent defective parts. If the days production is inspected 100 percent whenever the sample of 10 gives 2 or more defective parts, what is the probability that a day's production will be inspected 100 percent?

(c) Find the mean and the standard deviation of the binomial distribution.

(d) A manufacturer of envelopes knows that the weight of envelopes is normally distributed with mean 1.9 gm and variance 0.01 gm. Find how many envelopes weighing

(i) 2 gm or more

(ii) 2.1 gm or more, can be expected in a given packet of 1000 envelopes

\[ \phi(1) = 0.3413 \text{ and } \phi(2) = 0.4772. \]
1. (a) Show that the functions
   \[ f(z) = \frac{x^2 y^3 (x + iy)}{x^4 + y^4}, \quad z \neq 0 \text{ and} \]
   \[ f(0) = 0 \]
   is not analytic at the origin although Cauchy-Riemann equations are satisfied at the point.

(b) Show that the function \( u = \frac{1}{2} \log (x^2 + y^2) \) is harmonic. Find its harmonic conjugate.

   OR

(b') If \( u + v = \frac{2 \sin 2x}{e^{2y} + e^{-2y} - 2 \cos 2x} \) and \( f(z) = u + iv \) is an analytic function of \( z = x + iy \), find \( f(z) \) in terms of \( z \).

(c) Use Cauchy's integral formula to evaluate \( \int_C \frac{z}{(z^2 - 3z + 2)} \, dz \), where \( C \) is the circle \( |z - 2| = \frac{1}{2} \).

2. (a) Obtain the Taylor/Laurent series which represents the function
   \[ f(z) = \frac{1}{(1 + z^2) (z + 2)} \]
   when

(i) \( 1 < |z| < 2 \)

(ii) \( |z| > 2 \)

(b) Evaluate the integral using residue theorem
   \[ \int_C \frac{4 - 3z}{z(z - 1)(z - 2)} \, dz \]
   where
   \[ C \text{ is the circle } |z| = \frac{3}{2}. \]
3. (a) Solve the system of equations by Gauss-Seidel iterative method by applying three iterations:

\[ 54x + y + z = 110 \]
\[ 2x + 15y + 6z = 72 \]
\[ -x + 6y + 27z = 85. \]

(b) (i) Use Newton-Raphson method to find a real positive root of the question:
\[ x^4 - x - 9 = 0, \text{ correct to three places of decimals.} \]

(ii) Find a real root of the equation \( x^3 - 5x - 11 = 0 \) by the method of iteration correct to three decimal places.

(c) Finding the missing values in the following table:

<table>
<thead>
<tr>
<th>x</th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>6</td>
<td>10</td>
<td>17</td>
<td>31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(c') Given the following table, find the interpolating polynomial by using Newton-

<table>
<thead>
<tr>
<th>x</th>
<th>-1</th>
<th>0</th>
<th>2</th>
<th>3</th>
<th>7</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>f(x)</td>
<td>-11</td>
<td>1</td>
<td>1</td>
<td>141</td>
<td>561</td>
<td></td>
</tr>
</tbody>
</table>

4. (a) Given

<table>
<thead>
<tr>
<th>x</th>
<th>1.0</th>
<th>1.1</th>
<th>1.2</th>
<th>1.3</th>
<th>1.4</th>
<th>1.5</th>
<th>1.6</th>
</tr>
</thead>
</table>

Find \( \frac{dy}{dx} \) and \( \frac{d^2y}{dx^2} \) at (i) \( x = 1.11 \) (ii) \( x = 1.6 \).
(b) Evaluate
\[ \int_{0}^{1} \frac{dx}{1 + x^2} \] by using Simpson's \( \left( \frac{1}{3} \right) \) rule dividing the range into 6 equal parts.

Hence obtain the approximate value of \( \pi \).

(c) Given
\[ \frac{dy}{dx} = \sqrt{x+y}, \quad y = 1 \text{ where } x = 0. \text{ Find } y(0.2) \text{ by Runge-Kutta method of order 4. Taking } h = 0.2. \]

OR

(c') Solve the boundary value problems:
\[ y'' + y' = x; \quad y(0) = 0, y(1) = 1. \]

be finite difference method. Take \( h = \frac{1}{3} \).
Values of some constants: Energy gap for Si = 1.12 eV; Thermal voltage (kT/e = 25 mV at room Temp.); Permittivity of free space (ε₀ = 8.85×10⁻¹² F/m); Permittivity of silicon (εᵣ = 12 ε₀); Permittivity of oxide (ε₉ = 3.9 ε₀); Nᵥ = 2.8×10¹⁹ cm⁻³; Nᵣ = 1.04×10¹⁹ cm⁻³

1(a) Using Boltzmann’s approximation, derive the following relation.

$$n_p = N_v \exp \left( \frac{-\left(E_v - E_F\right)}{kT} \right)$$

1(b) For a graded p-n junction diode, show that the electric field is given by

$$E = \frac{ea}{2\varepsilon_s} \left( x^2 - x^2_0 \right)$$

where α is the gradient of the net impurity concentration as shown in Figure 1 below.

Figure 1. Space charge density in linearly graded p-n junction.
1(c) Determine $v_o$ for the network of Figure 2, for the input indicated. Explain all steps.

![Figure 2. Applied signal and network for problem 1(c)](image)

2(a) Draw the minority carrier profile for BJT connected in active mode and derive the expression for collector current.

2(b) In BJT, why base is lightly doped and emitter is highly doped? What is small signal approximation? Derive the expression for transconductance.

2(c) Draw the small signal equivalent circuit for the common emitter amplifier. Derive the expressions for its voltage gain and input impedance.

OR

2'(a) What is “Early effect”? For a npn transistor operating at a $v_{be}$ of 670 mV and $I_C = 3 mA$, the $I_C - V_C$ characteristics has a slope of $3 \times 10^{-3} \text{ mho}$. Determine the output resistance and Early voltage.

2'(b) A CE amplifier circuit with $V_{cc} = 5V$, dc collector voltage is 2 V and $R_C = 1\text{k}\Omega$. Find collector current and small signal voltage gain.

2'(c) How the internal capacitance in BJT affect the performance of BJT amplifiers? Derive the expression for unity gain bandwidth ($\omega_r$).

3(a) Derive the small signal model of a MOSFET operating in saturation region and convert it into the T-model.

3(b) What is Channel Length Modulation (CLM)? How it will affect the output characteristics of MOSFET?

3(c) An n-channel MOSFET with $t_{ox} = 20nm$, $\mu_n = 650\text{cm}^2/\text{V.s}$, $V_t = 0.8V$ and $W/L = 10$. Find the drain current in the following cases

i. $V_{gs} = 5V$ and $V_{ds} = 1V$

ii. $V_{gs} = 2V$ and $V_{ds} = -1.2V$

iii. $V_{gs} = 5V$ and $V_{ds} = 5V$

iv. $V_{gs} = 5V$ and $V_{ds} = 0.2V$
3'(a) Discuss some important application of the MOSFET with sketches and with appropriate equations.

3'(b) A common-gate amplifier using an n-channel enhancement MOS transistor for which $g_m = 5 \text{ mA/V}$ has a $3$-$k\Omega$ drain resistance ($R_D$) and a $2$-$k\Omega$ load resistance ($R_L$). The amplifier is driven by a voltage source having a $200$-$\Omega$ resistance. What is the input resistance of the amplifier? What is the overall voltage gain $G_v$. If the circuit allows a bias-current increase by a factor of $4$ while maintaining linear operation, what do the input resistance and the voltage gain become.

3'(c) What is the need of high frequency models for MOSFETs? Derive the expression of unity gain frequency ($f_T$).

4(a) What is feedback? What are the effects of negative feedback on amplifier characteristics?

4(b) Draw the diagram of RC phase shift oscillator and derive the expression for condition of oscillation as well as frequency of oscillation.

4(c) Suppose that the OP-AMP shown in Figure 3 has infinite input resistance and zero output resistance. Find an expression for the feedback factor if non inverting amplifier shown in Figure 3 has open loop voltage gain $A = 10000$, find $\frac{R_f}{R_g}$ to obtain a close loop voltage gain of 10. What is the amount of feedback in decibels? If source voltage is $1$V, find output voltage, feedback voltage and input voltage. If $A$ decreases by $20\%$, what is the corresponding decrease in close loop voltage gain?

![Figure 3](image-url)
2012-2013
E.TECH. AUTUMN (III SEMESTER) EXAMINATION
(ELECTRONICS ENGINEERING)
CIRCUIT THEORY
EL 212
Credits: 4

Maximum Marks: 60

Answer all the questions. Symbols/Notations used have their standard meanings.

1(a) For the network shown in figure 1, determine voltages \( V_{AB} \), \( V_{BC} \) and \( V_{CD} \) by nodal analysis.
   (b) Calculate the current I through the 20 \( \Omega \) resistance of the network, shown in figure 2 by using superposition theorem.
   (c) Represent the function shown in figure 3, in terms of trigonometric Fourier series.

OR

1' (a) State and verify Tellegen’s theorem for the network shown in figure 4.
   (b) Find the mesh currents \( I_1 \), \( I_2 \) and \( I_3 \) for the network shown in figure 5.
   (c) A series RLC circuit has \( Q = 5.1 \) at its resonant frequency of 100 KHz. Assuming the power dissipation of the circuit is 100 W, when drawing a current of 0.8 A, find
      (i) \( R \)
      (ii) Bandwidth of the circuit
      (iii) Half power frequencies

2 (a) Prove the statement that “In a linear graph every cut set has an even number of branches in common with every loop”.
   (b) With the help of a graph, express the relation between branch voltages and tree branch voltages.
   (c) Write the node equation for the network shown in figure 6.

3(a) Find the indefinite admittance matrix for the network shown in figure 7.
   (b) For a 2-port network, obtain a single-controlled source model of a non-reciprocal set of \( y \)-parameters.
   (c) For the network shown in figure 8, determine the \( y \) and \( h \) parameters.

OR
3.(a) Briefly describe the term 'Image Impedance'. Also evaluate its expression in terms of \( A \) \( B \) \( C \) \( D \) parameters.

(b) Express the inter-relationship between

(i) \( g \)-parameters in terms of \( y \)-parameters.

(ii) \( h \)-parameters in terms of \( A \) \( B \) \( C \) \( D \) parameters.

(c) For the given network shown in figure 9, the short circuit and open circuit impedances are given by: \( Z_{SC1} = Z_{SC2} = 8/11 \ \Omega \) and \( Z_{OC1} = Z_{OC2} = 11/5 \ \Omega \). Find the values of impedances \( Z_1, Z_2 \) and \( Z_3 \).

4.(a) Write the state equations of the circuit shown in figure 10.

(b) What do you infer from the 'order of complexity of the network'? Determine the same for the network shown in figure 11.

(c) With the help of graph theory, write the state equations for the circuit shown in figure 12.

(Fig. Attached)
2012-2013
B.TECH. AUTUMN (III SEMESTER) EXAMINATION
(ELECTRONICS ENGINEERING)
MEASUREMENT AND INSTRUMENTATION
(EL-221)
Credits: 04

Maximum Marks: 60
Duration: Three Hours

Answer all the questions.
All questions carry equal marks.

1. Describe the construction and theory of operation of the thermal instruments. How they are used as an Ammeter and Voltmeter? Mention the advantages and disadvantages of these instruments.
   15

2. Explain the construction and theory of operation of the Hall Effect wattmeter OR electrodynamometer type wattmeter. What are the sources of errors and how are they minimized?
   15

3. (a) Explain the Wagner's earthing device.
   05
   (b) An a.c. bridge is balanced at 1 kHz and has the following constants: AB, 0.2μF pure capacitor, BC, 500Ω pure resistor, CD, unknown, DA, a resistor of 300Ω in parallel with a 0.1μF capacitor. Find the component values in arm CD, expressed as series combination.
   10

OR

3'. (a) Explain the theory of a series type Q-meter.
   10
   (b) A coil with a resistance of 3Ω is connected to the terminals of a Q-meter. Resonance occurs at an oscillator frequency of 5 MHz and a resonating capacitor of 100 pF. Calculate the percentage error introduced by the insertion resistance if its value is 0.1Ω.
   05

4. (a) What are the common applications of CROs? Explain them briefly.
   07
   (b) Describe the construction and principle of operation of any two types of transducers suitable for the measurement of pressure.
   08
Maximum Marks: 60

Answer all the questions.

All questions carry equal marks.

1. (a) Describe the Weston Cell used as an c.m.f. standard.
(b) Describe the true RMS reading voltmeter.

2. (a) Explain the voltmeter used for measuring the Peak value of an a.c. voltage.
(b) Explain the principle of operation of single phase dynamometer type power factor meter.

OR

2'. (a) Explain the measurement of low resistance by K.D.B. What are the sources of errors in it?
(b) Explain the Wagner's earthing device as used in a.c. bridges.

3. (a) Derive the balance conditions for Schering's bridge. How this bridge can be used for the measurement of loss angle of a capacitor and the dielectric constant of a material.
(b) Describe the construction and working of any one type of Ohmmeter.

4. (a) Describe any two types of transducers for the measurement of pressure, indicating their pressure ranges.
(b) Describe the construction and working of an LVDT for the measurement of linear displacement.

OR

4'. (a) Explain the working of radiation pyrometer. Mention the temperature range which can be measured by it.

Duration: Three Hours
5. (a) What are the common applications of CROs? Explain them briefly.
(b) Explain the following types of CROs briefly and indicate their applications:
   
   (i) Double beam and dual trace
   (ii) Storage
   (iii) Sampling
   (iv) Digital read out
2012-2013
AUTUMN SEMESTER B. TECH EXAMINATION
(ELECTRONICS ENGG)
EL-241: SIGNALS AND SYSTEMS
(Credits – 04)

Maximum Marks: 60
Duration: Three Hours

Notes:
(i) Answer all questions. Make suitable assumptions if required.
(ii) Symbols and abbreviations have their usual meanings.

1 (a) A system (continuous or discrete-time) may be classified on the basis of following properties: with memory or memoryless system, time variant or time invariant system, linear or non-linear system, causal or non-causal system, stable and unstable system. For any two of the following input-output relationship, characterize the system in terms of these properties. Justify your answers.

\[
\begin{align*}
(i) \quad y(t) &= [\cos(3t)]x(t) \\
(ii) \quad y(t) &= \begin{cases} 0 & t < 0 \\ x(t) + x(t - 2) & t \geq 0 \end{cases} \\
(iii) \quad y[n] &= nx[n] \\
(iv) \quad y[n] &= x[n - 2] - 2x[n - 8]
\end{align*}
\]

(b) Represent any one of the following signals (shown in Fig. 1) in terms of elementary signals.

\[\text{Fig. 1 (i)}\]

\[\text{Fig. 1 (ii)}\]

(c) Consider a LTI system S and a signal \(x(t) = 2e^{-3t}u(t - 1)\). If

\[x(t) \rightarrow y(t) \quad \text{and} \quad \frac{dx(t)}{dt} \rightarrow -3y(t) + e^{-2t}u(t)\]

Determine the impulse response \(h(t)\) of system S.

OR

(c') Determine and sketch the convolution of following two signals:

\[x(t) = \begin{cases} t + 1, & 0 \leq t \leq 1 \\ 2 - t, & 1 < t \leq 2 \\ 0, & \text{elsewhere} \end{cases}\]

\[h(t) = \delta(t + 2) + 2\delta(t + 1)\]
(d) Let \( x_1(t) \) be a continuous time periodic signal with fundamental frequency \( f_1 \) and exponential Fourier coefficients \( a_n \). Given that
\[
x_2(t) = x_1(t - 1) + x_1(t - 1),
\]
How the fundamental frequency \( f_2 \) of \( x_2(t) \) is related to \( f_1 \)? Also, find a relationship between the Fourier series coefficients \( b_n \) of \( x_2(t) \) and coefficients \( a_n \).

\[
(4)
\]

OR

(d') Determine the exponential Fourier series representation of a periodic signal \( x(t) \) with period 2, defined as
\[
x(t) = e^{-t} \text{ for } -1 < t < 1
\]

2 (a) Compute the Fourier Transform of the signal
\[
x(t) = \begin{cases} 
1 + \cos(\pi t), & |t| \leq 1 \\
0, & |t| > 1
\end{cases}
\]
Also plot the amplitude and phase spectrum of the signal.

(b) Given the relationship \( y(t) = x(t) * h(t) \) and \( g(t) = x(3t) * h(3t) \) and given that \( x(t) \) has Fourier Transform \( X(f) \) and \( h(t) \) has Fourier Transform \( H(f) \), use the Fourier Transform properties to show that \( g(t) \) has the form
\[
g(t) = A \cdot y(Bt).
\]

Determine the values of \( A \) and \( B \).

(c) Determine the Hilbert Transform of signal \( x(t) = \frac{\sin t}{t} \).

(d) Consider the signal \( x[n] = \left(\frac{1}{2}\right)^n u[n - 3] \). Find the Z-transform of the signal and specify its region of convergence.

OR

2' (a) Consider the signal
\[
x(t) = \begin{cases} 
e^{-t}, & 0 \leq t \leq 1 \\
0, & \text{elsewhere}
\end{cases}
\]
Determine the Fourier Transform of the signal \( x_2(t) = x(t) - x(-t) \), by explicitly evaluating only the transform of \( x(t) \) and using appropriate properties of Fourier transform.

(b) Determine the Laplace Transform, and region of convergence of the signal \( x(t) = \sqrt{2} e^{-2|t|} \).
(c) State the Sampling Theorem for low pass signals. A signal $x(t) = 10 \cos(20 \pi t) \cos(200 \pi t)$ is sampled at the rate of 250 samples per second.

(i) What is the Nyquist rate for $x(t)$?
(ii) Determine the spectrum of resulting sampled signal.


3. (a) Find the transfer function $Y(s)/R(s)$ of the system shown in Fig. 2, using block diagram reduction technique.

\[ \begin{array}{c}
H_2 \\
 G_1 \\
 G_2 \\
 G_3 \\
 G_4 \\
 H_1 \\
 R(s) + \times \rightarrow \delta \rightarrow + \rightarrow \delta \rightarrow \times \rightarrow Y(s)
\end{array} \]

Fig. 2

(b) Discuss the conditions of stability for continuous-time and discrete-time systems.

(c) Consider a causal and stable LTI system characterized by second-order differential equation

\[ 5 \frac{d^2 y(t)}{dt^2} + 4 \frac{dy(t)}{dt} + 5y(t) = 7x(t) \]

Determine whether the corresponding system is under-damped, over-damped, or critically damped.

4. (a) Let two honest coins, marked 1 and 2, be tossed together. The four possible outcomes are $T_1T_2$, $T_1H_2$, $H_1T_2$, $H_1H_2$. ($T_1$ indicates toss of coin 1 resulting in tails; similarly $T_2$ etc.) We shall treat that all these outcomes are equally likely; that is the probability of occurrence of any of these four outcomes is $\frac{1}{4}$. (Treating each of these outcomes as an event, we find that these events are
mutually exclusive and exhaustive). Let the event \( A \) be 'not \( H_1H_2 \)' and \( B \) be the event 'match'. (Match comprises the two outcomes \( T_1T_2, H_1H_2 \)). Find \( P(B \mid A) \). Are \( A \) and \( B \) independent?

(b) Consider a random variable \( X \) defined by its probability density function (pdf)

\[
    f_X(x) = ae^{-b|x|}, \quad -\infty < x < \infty
\]

Where \( a \) and \( b \) are positive constants.

(i) Determine the relationship between \( a \) and \( b \) so that \( f_X(x) \) is a valid pdf.

(ii) Determine the corresponding CDF, \( F_X(x) \).

(c) Consider a random variable \( X \), whose power spectral density is defined as

\[
    f_X(x) = \begin{cases} 1, & \quad -\frac{1}{2} < x < \frac{1}{2} \\ 0, & \text{otherwise} \end{cases}
\]

If \( Y \) is another random variable defined as \( Y = \cos(\pi X) \), evaluate \( E[Y] \) and \( \sigma_Y^2 \).

OR

(c') Define power spectral density (PSD) of an wide-sense stationary (WSS) random process and prove the following properties of PSD;

(i) PSD at zero frequency is the area the autocorrelation function.

(ii) The power spectral density of a real-valued random process is an even function of frequency.

(iii) PSD of a WSS random process is always positive.
2012-2013
B.TECH. AUTUMN (III SEMESTER) EXAMINATION
(ELECTRONICS / COMPUTER ENGINEERING)
COMMUNICATION SKILLS
(HU-202)
Credits: 04

Maximum Marks: 40
Duration: Three Hours.

Answer all questions.

1. You are the Sales Manager of a firm supplying educational technologies to academic institutions. Draft a persuasive letter to be sent to the Principals of Colleges to promote the concept of ‘Smart Classroom’.

OR

On behalf of the Principal of your College, write a letter of enquiry to the ‘Software Solutions’, Nehru Place, New Delhi, seeking the details of educational softwares available for Engineering Colleges specially for the labs, classrooms and language lab.

2. Write a job application and create a resume in response to the following advertisement:
3. Write short notes on any one of the following and give appropriate examples.

(a) Memo
(b) Press Notice.

4. Read the following passage and (a) Make notes in an appropriate format
(b) Write an abstract of the passage.

As many as 1,075 satellites will be built worldwide over the next 10 years and $200 billion of revenue will be generated from their manufacture and launch, according to Euroconsult, the Paris-based consulting and analysis firm specialising in the global space industry.

In comparison, 820 satellites were made and launched in the last 10 years.

Governments will order over 60 per cent of them or nearly 700 spacecraft mostly for earth observation purposes, it says. They will also contribute 66 per cent of the decade's revenue from making and launching them.

Revenues from the manufacture and launch of these satellites for 2012-23 will see 36 per cent growth over that from the last 10 years, says Euroconsult's latest and the 18th annual research report, Satellites to be built & launched by 2021: World Market Survey.

The earth observation category during the period is expected to number around 260, said the 69-year-old Euroconsult, which focuses on space applications, communications, and digital broadcasting.

Over the next six years, an average of 230 satellites a year will be put into orbit, it estimates. The launch tempo will decelerate at the end of the period as government and commercial satellite constellations complete their deployment. (The cyclical pattern is said to be typical of the world satellite industry.)

The six established space powers — the U.S., Russia, Europe, Japan, China and India — are forecast to continue dominating 80 per cent of future government satellite demand.

This will be in spite of a new set of space-faring countries emerging.

In the growth year of 2011, the world saw 100 spacecraft launched "an activity unknown since the late 1990s," the report says.

That kind of peak was last seen when mobile personal communications were taking off and the first generation of the two commercial satellite constellations were put into orbit. These new players are expected to account for 10 satellites of different sizes and uses.

According to Rachel Villain, Director of Space at Euroconsult and editor of the research report, "Governments in established space countries continue to drive innovation for satellite systems with benefits for their local industries even if systems' replacements are more carefully assessed in the countries where cost limits become stricter."

During the decade, she said, the commercial space industry would be generating almost 75 per cent of its new orders as replacements of ageing spacecraft for communication and broadcasting purposes.

Some 50 companies are engaged in processing and operating such satellites in the GEO (or geostationary earth orbit). Euroconsult observes that numerous government-backed operators are acquiring their first satellites to manage satellite bandwidth on their own.

Among them are new country players such as Turkmenistan, Laos and Kiribati which together account for 14 upcoming satellites.
5. Reproduce the script of a job interview you attended for the post of Junior Software Analyst at HCL, Noida.

OR

Generate a group discussion among at least four participants on one of the following topics:

(a) FDI will boost Indian economy in the retail sector.
(b) There should be a retirement age for the politicians.