Code: 9ABS102

R9

B.Tech I Year (R09) Supplementary Examinations, November/December 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 the phenomenon of interference.
   (b)   What are the necessary conditions for obtaining interference fringes?
   (c)   Give the analytical treatment of interference of light and hence obtain the condition for
         maximum and minimum intensity.

2 (a)   Describe the seven crystal systems with diagrams.
   (b)   Classify various lattice types in the crystal system.

3 (a)   What are Matter waves? Explain their properties.
   (b)   Obtain the expression for the wavelength of matter waves.
   (c)   Calculate the wavelength associated with an electron raised to a potential 1600V.

4 (a)   Write notes on classification of semiconductors.
   (b)   Explain the terms Mean life time and Diffusion length.

5 (a)   What are dielectric materials and describe the dielectric behaviour in The presence of
         electric field.
   (b)   What is dielectric constant and explain the factors on which it depends.

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)   Explain the principle of an optical fiber.
   (b)   Describe the fiber construction.

8 (a)   Write a detailed note on Nanomaterials.
   (b)   Explain why Nanomaterials exhibit different properties.

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Code: 9ABS103

R9

B.Tech I Year (R09) Supplementary Examinations, November/December 2011
ENGINEERING CHEMISTRY
(Common to all branches)

Time: 3 hours   Max Marks: 70

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

1   Write a brief note on any two of the following:
   (a) Ion exchange resins.
   (b) Dissolved oxygen.

2 (a) Explain the evolution hydrogen type of corrosion with mechanism.
   (b) write a note on galvanization process

3   Write short notes on the following:
   (a) Conducting polymers.
   (b) Liquid crystal polymer.

4 (a) How are lubricant classified? Give example?
   (b) Explain the Boundary film lubrication theory and the mechanism of the lubricants.

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 (a) What is a eutectic? Can it be called a compound? Why?
   (b) Applications of Phase Rule by taking suitable examples.

7   Write short notes on:
   (a) Water gas.
   (b) Producer Gas.

8   Explain the hardening and setting of cement using the chemical equations.

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Code: 9ABS104

R9

B.Tech I Year (R09) Supplementary Examinations, November/December 2011
MATHEMATICS - I
(Common to all branches)

Time: 3 hours

Max Marks: 70

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

1 (a) Solve : $\left(x^2 - 1\right)\dfrac{dy}{dx} + 2xy = 1$

(b) Solve : $x\dfrac{dy}{dx} + y = \log x.$

2 (a) Solve : $\dfrac{d^2 y}{dx^2} + 4\dfrac{dy}{dx} + 3y = e^{2x}$

(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, π].

4 (a) Trace the limacon : r = 4 + 2 cosθ.

(b) Trace the curve r = a sin3θ.

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 $\int_0^1 \int_x^{\sqrt{2-x^2}} \dfrac{x\, dy\, dx}{\sqrt{x^2+y^2}}$.

6 (a) Find the Laplace Transform of $\left\{\left(\sqrt{t} + \dfrac{1}{\sqrt{t}}\right)^3\right\}$

(b) Find $L^{-1}\left\{\dfrac{s}{s^4+4a^4}\right\}.$

7 (a) Using Laplace Transform, show that $\int_0^\infty t^2\, e^{-4t} \sin 2t\, dt = \dfrac{11}{500}.$

(b) Solve the D.E $\quad y'' + n^2 y = a\sin(nt + 2),\, y(0) = 0, y'(0) = 0$ Using Laplace transform.

8 (a) Prove that $\nabla \cdot \left(\overline{A} \times \overline{B}\right) = \overline{B} \cdot \left(\nabla \times \overline{A}\right) - \overline{A} \cdot \left(\nabla \times \overline{B}\right).$

(b) Apply Greens theorem to evaluate $\int_C \left[(2x^2 - y^2)\, dx + (x^2 + y^2)\, dy\right]$, where C is the boundary of the area enclosed by the x-axis and upper half of the circle x² + y² = a² .

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Code: 9ABS105

B.Tech I Year (R09) Supplementary Examinations, November/December 2011
MATHEMATICAL METHODS
(Common to CSE, ECE, EEE, EIE, ECM, E.Con.E, IT, and CSS)

Time: 3 hours   Max Marks: 70
Answer any FIVE questions
All questions carry equal marks
*****

1   (a)   Prove that if λ_1, λ_2 , …… λ_n are the eigen values of A then $\lambda_1{}^k$, $\lambda_2{}^k$, ….. .. $\lambda_n{}^k$ are the eigen values of A^k

   (b)   Determine the eigen values of A^{-1} where A $= \begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$

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 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   Fit a polynomial of second degree to the data points given in the following table.

x:	0	1.0	2.0
y :	1.0	6.0	17.0

5   Using modified Euler's method, find an approximate value of y when
         $x = 1.3, given\ that\ \frac{dy}{dx} + \frac{y}{x} = \frac{1}{x^2}$, $y(1) = 1.$

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   Solve the one dimensional heat flow equation $\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2}$ given that $u(0, t) = 0$, $u(L, t) = 0, t > 0$ and $u(x, 0) = 3\sin\left(\frac{\pi x}{L}\right), 0 < x < L.$

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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R9

B.Tech I Year (R09) Supplementary Examinations, November/December 2011
ENGINEERING MECHANICS
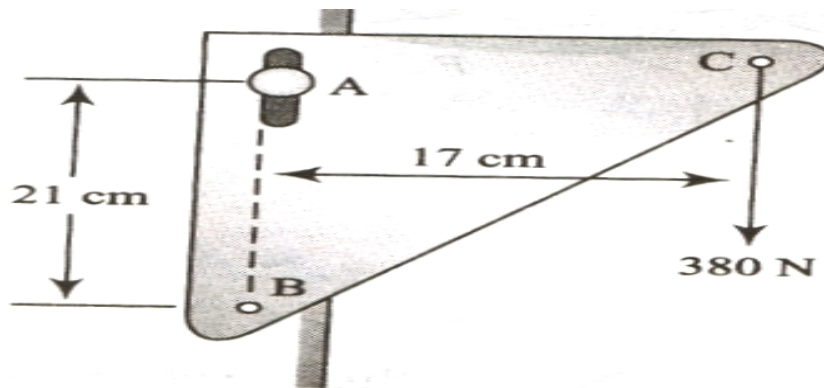(Common to Aeronautical Engg, Biotechnology, Civil Engg, and Mechanical Engg)
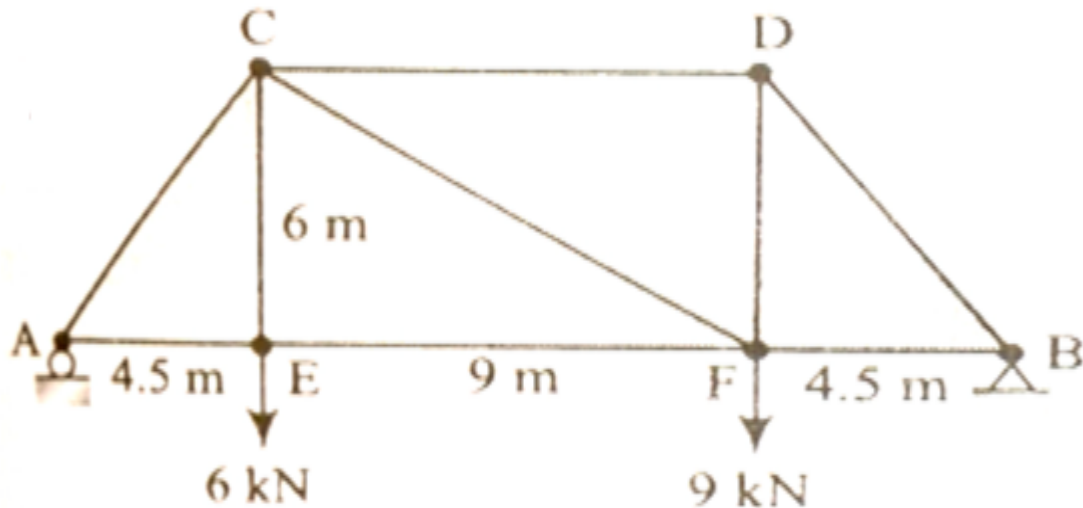
Time: 3 hours
Max Marks: 70

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

1   In the triangular bracket as shown in fig, the bolt A fits loosely in a vertical slot. Determine the reaction at A and B.

2   Determine the induced forces in each members of the frame as loaded and supported as shown in the below figure.

3 (a) Explain the types of friction with examples.
   (b) Two equal bodies A and B of weight 'W' each are placed on a rough inclined plane. The bodies are connected by a light string. If $\mu A = 1/2$ and $\mu B = 1/3$, show that the bodies will be both on the point of motion when the plane is inclined at $\tan^{-1} (5/12)$.

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 the terms centroid, moment of inertia and radius of gyration.
  (b) Find the area moment of inertia of an equilateral triangle of side 'a' with respect to one of its side.

6 (a) An airplane is flying horizontally with a velocity of 450 Kmph at an attitude of 1960 m towards a target on the ground which is to be bombed. Estimate where the bomb must be released in order to hit the target and the time of travel of the bomb. What is the velocity with which the bomb will hit the target? Also find the angle made by the line of the sight of the pilot when the bomb is released.
  (b) The acceleration of a particle is defined by the relation, $a = Kt - 4$. Knowing that $v = 4$ m/s when $t = 2$ sec and $v = 1$ m/s when $t = 1$ sec, determine the constant 'K'. Write the equations of the motion when $x = 0$ at $t = 3$ sec

7 (a) An automobile moving with a uniform velocity of 40 kmph is accelerated by increasing the traction force by 20%. If the resistance to motion is constant, find the distance traveled before it acquires 50 kmph. Use work-energy method.
  (b) A solid cylinder and a sphere are started top of an inclined plane, at the same time, and both roll without slipping down the plane. If when the sphere reaches the bottom of incline, the cylinder is 12 m behind it, what is the total length 'S' of the incline?

8 (a) The amplitude and max. velocity of a particle is 40 cm and 2m/s. A particle moves in SHM. Determine the max. acceleration of the particle and the period of its motion.
  (b) The particle which moves in SHM has max. velocity of 100 mm/sec. and max. acceleration of 2m/sec2. Determine the amplitude and frequency of the motion.

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R9

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

Time: 3 hours   Max Marks: 70

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

1 (a)   The major and minor axis of an ellipse is 120&80 mm. draw an ellipse by arcs of circles
         method.
   (b)   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.

2 (a)   Draw the projection s of a line CD 50 mm long, parallel to HP and inclined to VP. The
         end of C is 10 mm in front of VP and D is 30 mm in front of VP. The line is 15 mm
         above HP.
   (b)   A line AB is 75 mm long. A is 50 mm in front of VP and 15 mm above HP. B is 15mm
         in front of VP and is above HP. Top View of AB is 50mm long. Draw and measure the
         front view. Find the true inclinations

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 cylinder of base 40 mm diameter, axis 50mm long, resting on
         ground on its base.
   (b)   Draw the projections of a hexagonal pyramid axis 60 mm long, base 30 mm side having
         base on the ground and one of edges of base inclined at 45^0 to V.P.

5 (a)   A hexagonal pyramid side of the base 30 mm and altitude 70 mm rests with its base on
         HP and with a side of the parallel to VP. It is cut by a cutting plane inclined at 35^0 to HP
         and perpendicular to VP and is bisecting the axis. Draw the sectional plan of the
         pyramid and the true shape of the section.
   (b)   A cylinder of base diameter 45 mm and height 65 mm rests on its base on HP. It is cut
         by a plane perpendicular to VP and inclined at 30^0 to HP and meets the axis at a
         distance 30 mm from base. Draw the front view, sectional top view, and the true shape
         of section.

6   Draw the front view, top view and right side view of the object shown below (dimensions in mm)
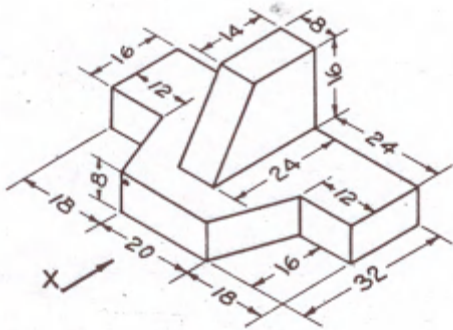
7   A square prism of base 50 mm side and height 125 mm stands on the ground with its side of base inclined at an angle of 30^0 to VP. It is penetrated by a cylinder of diameter 50 mm and axis 125 mm long. The axis of the cylinder is parallel to both HP and VP and bisects the axis of the prism.

Draw the projection showing fully the curves of intersection.

8   Draw a perspective view of a square plane with a 50 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 40 mm in front of PP, 50 mm above GP and lies in a CP which is 30 mm towards right of the corner touching the PP.

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Code: 9A03101b

R9

B.Tech I Year (R09) Supplementary Examinations, November/December 2011
ENGINEERING DRAWING
(Common to Mechanical Engineering, Electronics & Communicatioin Engineering, Electronics & Control Engineering,
and Computer Science & Systems Engineering)

Time: 3 hours

Max Marks: 70

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

1 (a) Inscibe an ellipse in a parallelogram having sides 150 mm and 100 mm long and an included angle of 120^0.
   (b) A point P is 30 mm and 50 mm respectively from two straight lines which are at right angles to each other .Draw the rectangular hyperbola from p within 10 mm distance from each line.

2 (a) A line PQ, 9cm long is in the H.P and makes an angle of 30 degrees with the V.P Its end P is 2.5 cm in front of the V.P. Draw its Projections.
   (b) A 100 mm long line is parallel to and 40 mm above the H.P. Its two ends are 25 mm and 50 mm in front of the V.P. respectively. Draw the projections of the line and determine its inclination with the v.P.

3 (a) A square lamina of 40 mm side is perpendicular to H.P One of its sides is 20 mm above H.P and 15 mm in front of V.P. Draw its projections.
   (b) A square lamina of 40 mm is perpendicular to both planes. Draw projections with lamina is 25 mm above H.P and 40 mm in front of V.P.

4 (a) Draw the projections of a triangular prism base 40 mm side and axis 50 mm long, resting on one of its bases on the H.P. with a vertical face perpendicular to the V.P.
   (b) Draw the projections of a pentagonal pyramid axis 60 mm long, base 30 mm side having base on the ground and one of edges of base inclined at 45^0 to V.P.

5 (a) A cone of base diameter 50 mm and axis length 60 mm is resting on HP on its base. It is cut by a plane inclined at 40^0 to VP and perpendicular to HP that cuts the cone at distance 10 mm from the axis and in front of it. Draw its top view, sectional front view and true shape of section.
   (b) A square pyramid of base side 30 mm and axis length 60 mm is resting on HP on its base with a side is inclined at 30^0 to VP. It is cut by a plane perpendicular to both HP and VP and is 10 mm away from the axis. Draw its top view, front view and sectional side view.

6   Two views of a casting are shown below. Draw the isometric view of the casting (dimensions are in mm)
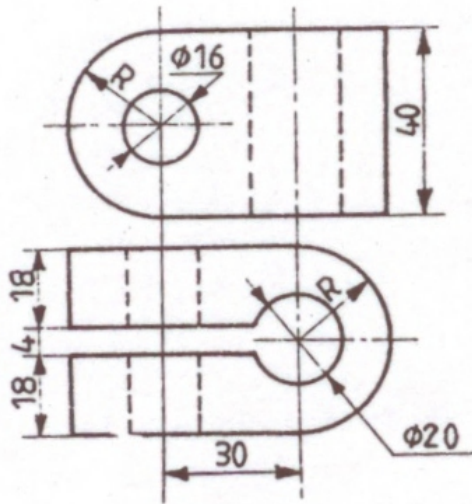
7   A hexagonal prism of side of base 30 mm is resting on one of its bases on HP with a face parallel to VP. The prism contains a square hole of 20 mm side. The axis of the hole is parallel to VP and inclined at an angle of 30^0 to the HP intersecting the axis of the prism. The faces of the hole are equally inclined to VP. Draw the lines 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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R9

B.Tech I Year (R09) Supplementary Examinations, November/December 2011
ENGINEERING DRAWING
(Common to Computer Science & Engineering, Electronics & Computer Engineering, and Information Technology)

Time: 3 hours   Max Marks: 70

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

1 (a) The major axis of an ellipse is 100 mm long and the distance between its foci is 70 mm. draw the ellipse.
  (b) Draw a hyperbola having the double ordinate of 100 mm, the abscissa of 60 mm and the transverse axis of 100 mm.

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

3 (a) An equilateral triangular lamina of side 30 mm is perpendicular to H.P and parallel to V.P One of its edges 15mm above H.P and 25 mm in front of V.P Draw its projections
  (b) A rectangular plate of negligible thickness and having 40X60 mm dimensions is perpendicular to both planes .It is longer side is perpendicular to V.P and in H.P and 20 mm in front of V.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 square pyramid of base side 35 mm and axis length 60 mm is resulting on HP on one of its triangular faces with its axis parallel to VP. It is cut by a plane inclined at 45^0 to VP and perpendicular to HP and is bisecting the top view of the axis. Draw its top view, sectional front view and true shape of section.
  (b) A hexagonal prism of base side 25 mm and axis length 60 mm is resting on HP on one of its base sides, with its axis inclined at 50^0 to HP and parallel to VP. It is cut by a plane inclined 65^0 to HP and perpendicular to VP and is passing through the top most edges e prism. Draw the front view, sectional top view and true shape of section.

6   Two views of a casting are shown below. Draw the isometric view of the casting
     (dimensions are in mm)
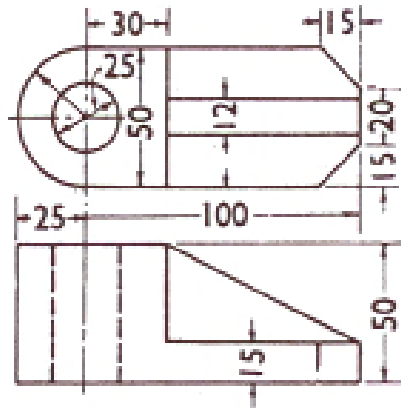
  (a)   A vertical cylinder of diameter 80 mm intersects a horizontal cylinder of diameter 40 mm.
7   The shortest distance between their axes is 40 mm. Draw the projections showing the
         intersection profile.
  (b)   A horizontal cylinder of 50 mm diameter penetrates a vertical cylinder of 75 mm 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 respective projection of a rectangular block of 3m x 2 m x 1.5 m resting on a
     horizontal plane with one side of the rectangular plane making an angle of 45^0 with VP.
     The observer is at a distance of 6 m from the picture plane. Assume eye level as 1.5 m.

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Code: 9A05101

B.Tech I Year (R09) Supplementary Examinations, November/December 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
*****

1   (a)   Mention the steps involved in Software Development Method.
    (b)   Briefly explain the need for software maintenance.
    (c)   What is an algorithm? Explain with suitable example?

2   (a)   What is an expression? Explain different categories of expressions.
    (b)   What are logical operators in C? Write a C program to illustrate the logical operators?

3   (a)   Write a program to find the factorial of a number using recursion?
    (b)   Write a short note on one dimensional arrays.

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)   What is the use of period operator? Give an example.
    (b)   Explain structure within structure using an example.

6   (a)   Write a program in C that reads the name of a file and displays the contents of the file
          on the user screen.
    (b)   Write a program in C that reads the contents of a file containing integers and displays
          the largest among the integers on the user screen.

7   (a)   What is circular queue?
    (b)   What are the advantages of circular queue over linear queue?

8   (a)   Discuss binary search algorithmic technique with an example.
    (b)   Write a program in C to perform linear searching method.

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Code: 9ABS101

R9

B.Tech I Year (R09) Supplementary Examinations, November/December 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
*****

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)   Write about Raman's childhood and education.
    (b)   Provide a note on his work on waves and light.

3   (a)   What health problems did Amartya Sen face at the age of eighteen?

    (b)   "The new professor has been just snatched from the cradle"- This is the beginning of Amartya Sen's professional career. Where did he receive this comment? What is his contribution to the Delhi School of Economics?

    (c)   What are the publications of Amartya Sen?

4   The world waits for none. Gertrude realized this and paved the way for her future and proved herself a successful chemist. Explain.

5   How did Anand become a great chess champion?

6   (a)   Discuss the period of Chaplin's entry into films.
    (b)   How and when did Chaplin make his professional debut?

PART - B

7   (a)   Write a letter to the post master of your town complaining about the non-receipt of a registered parcel.
    (b)   Write a letter to your friend inviting him to your birthday party.

8   (a)   Use the following idioms in your own words:
            1. To see eye to eye.
            2. Blood is thicker than water.

    (b)   Provide question tags:
            1. Look after my suitcase for me. _____
            2. Shut up! You can never keep quiet._____

    (c)   CORRECT THE FOLLOWING SENTENCES:
            1. We played Tennis tomorrow.
            2. This scissors isn't very sharp.

(d)   Fill in the blanks with suitable prepositions:
    1. I had lost my key but I managed to climb_____ the house through a window.
    2. Don't wait ـــــــ me. I'll join you later.

(e)   Insert articles where necessary:
    1. I first met her year ago
    2. Ganges is a holy river.

(f)   Fill in the blanks with the most appropriate form of the verbs in brackets:
    1. I _____(see) twenty films this year.
    2. Abu just _____(post)the letter that he _____(write) two weeks ago.

(g)   Write as directed:
    1. (a) Unless you work hard you cannot get the first rank
      (b) If you _____

    2. (a) You bought that car. You have done a foolish thing
      (b) It was_____

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