Hall Ticket No | | | | | | | | | | | Question Paper Code: AHS001

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Regular) - December, 2016

Regulation: IA-R16

ENGLISH FOR COMMUNICATION
(Common for AE/ME/CE)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Differentiate Active and Passive listeners. **[7M]**
   (b) List some measures to improve listening. **[7M]**
2. (a) What are the different types of Listening? **[9M]**
   (b) List some of the barriers that affect Listening. **[5M]**

UNIT – II

3. (a) List out the tips for effective oral communication. **[7M]**
   (b) How to overcome nervousness before a speech. **[7M]**
4. (a) What are the strategies to achieve effectiveness in conversation? **[7M]**
   (b) How do you start and end a conversation? **[7M]**

UNIT – III

5. (a) Write short notes on Skimming and Scanning **[7M]**
   (b) Write short notes on Intensive and Extensive Reading **[7M]**
6. (a) What are the things to be kept in mind while reading a text? **[7M]**
   (b) How does reading help improve communication? **[7M]**

UNIT – IV

7. What is an informal letter? How to write informal letters? **[14M]**
8. Write an email seeking information about registering for an English course in a school. **[14M]**

UNIT – V

9. List out the parts of speech and mention function of each part of speech with an example. **[14M]**

10. (a) Do as directed in the brackets. **[8M]**
    i. We shall go on a holiday. (identify the tense)
    ii. Honey is sweet. (identify the tense)
    iii. She **seldom** comes on time. (identify the part of speech)
    iv. His mother has been searching him for two hours. (Change into present perfect)
    v. **Whose** house is that? (identify the part of speech)
    vi. **These** toys are very expensive. (identify the part of speech)
    vii. The boy wore glasses. (add an adverb)
    viii. Everything seems normal. (add an adverb)

    (b) Give the meaning and frame a sentence for the following idioms **[6M]**
    i. to speak your mind
    ii. to cry wolf
    iii. in black and white

Hall Ticket No | | | | | | | | | | | Question Paper Code: AHS002

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Regular) - December, 2016

Regulation: IARE-R16

LINEAR ALGEBRA AND ORDINARY DIFFERENTIAL EQUATIONS

(Common for all branches)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Express the matrix $A = \begin{bmatrix} 2+3i & 0 & 4i \\ 5 & i & 8 \\ 1-i & -3+i & 6 \end{bmatrix}$ as sum of Hermitian and a Skew Hermitian matrices. **[7M]**

   (b) Find the rank of the matrix A= $\begin{bmatrix} 1 & -1 & 2 & -3 \\ 4 & 1 & 0 & 2 \\ 0 & 3 & 0 & 4 \\ 0 & 1 & 0 & 2 \end{bmatrix}$ by reducing it into normal form. **[7M]**

2. (a) Find the rank of the matrix $\begin{bmatrix} 4 & 0 & 2 & 1 \\ 2 & 1 & 3 & 4 \\ 2 & 3 & 4 & 7 \\ 2 & 3 & 1 & 4 \end{bmatrix}$ by applying elementary row transformations. **[7M]**

   (b) Solve: $x+2y+3z=5,\ 2x-4y+6z=18,\ 3x-9y-3z=6$ by using LU decomposition method. **[7M]**

UNIT – II

3. (a) Examine whether the vectors [2, -1, 3, 2], [1, 3, 4, 2], [3, -5, 2 ,2] are linearly independent or not **[7M]**

   (b) Find the eigen values and eigen vectors of $A = \begin{bmatrix} 2-i & 0 & i \\ 0 & 1+i & 0 \\ i & 0 & 2-i \end{bmatrix}$ **[7M]**

4. (a) Diagonalize the matrix $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ **[7M]**

(b) Verify the Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$ and hence find A^{-1} **[7M]**

UNIT – III

5. (a) Solve the differential equation $(x + \tan y)\, dy = \sin 2y\, dx$ **[7M]**

(b) At midnight, with the temperature inside your house at 70^o F and the temperature outside at 20^o F, your furniture breaks down. Two hours later, the temperature in your house has fall down to 50^o F. Assume that the outside temperature remains constant at 20^o. At what time will the inside temperature of your house reach 40^o F? **[7M]**

6. (a) If 30% of radioactive substance disappeared in 10 days. How long will it take for 90% of it to disappear? **[7M]**

(b) Solve the differential equation $\left(xy^2 - e^{1/x^3}\right) dx - x^2 y dy = 0$ **[7M]**

UNIT – IV

7. (a) Solve the differential equation $(D^2 - 2D + 2)y = x + e^x \cos x$ **[7M]**

(b) Solve the differential equation $(D^2 + 1)y = \frac{1}{1+\sin x}$ by the method of variation of parameters. **[7M]**

8. (a) Solve the differential equation $(D^3 + D^2 + 4D + 4)y = e^{-x} \cos x$ **[7M]**

(b) Solve the differential equation $(D^2 + 3D + 2)y = e^x$ by the method of variation of parameters **[7M]**

UNIT – V

9. (a) Verify Cauchy mean value theorem for the functions $f(x) = \log x$ and $g(x) = \frac{1}{x}$ in the interval $[1\,,\ e]$ **[7M]**

(b) A rectangular box open at the top is to have a volume of 32 cubic ft. Find the dimensions of the box requiring least material for its construction **[7M]**

10. (a) If $u = x + 3y^2 - z^3,\ v = 4x^2yz,\ w = 2z^2 - xy$ then find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$ at $(1, -1, 0)$ **[7M]**

(b) If $x^x y^y z^z = c$ then show that $\frac{\partial^2 z}{\partial x \partial y} = -\frac{(1+\log x)(1+\log y)}{z(1+\log z)^3}$ and hence deduce that $\frac{\partial^2 z}{\partial x \partial y} = -(x \log ex)^{-1}$ when $x = y = z$. **[7M]**

Hall Ticket No | | | | | | | | | | | Question Paper Code: AHS003

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Regular) - December, 2016

Regulation: IA-R16

COMPUTATIONAL MATHEMATICS AND INTEGRAL CALCULUS
(Common for CSE/IT/ECE/EEE)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Find the real root of the equation $log\ x - cos\ x = 0$, near 1.5 by using Newton-Raphson method. **[7M]**

   (b) Find the real root of the equation $x^2 - \log_e x - 12 = 0$, by false position method up to three decimal places. **[7M]**

2. (a) Find a real root of the equation $x\log_{10}x = 1.2$ by Newton Raphson method. Correct the root to three decimal places. **[7M]**

   (b) Obtain the interpolating polynomial passing through the points (0, 1), (1, 3), (2, 7) and (3, 13) and hence find $f(2.5)$

UNIT – II

3. (a) Fit a parabola $y = a + bx + cx^2$ to the following data: **[7M]**

x	-3	-2	-1	0	1	2	3
f(x)	4.63	2.11	0.67	0.09	0.63	2.15	4.58

   (b) Find $y\,(0.2)$, given that $\frac{dy}{dx} = 2y + 3e^x;\ y\,(0) = 0$ by Taylor's series method. **[7M]**

4. (a) Solve: $\frac{dy}{dx} = \log_{10}(x + y)\,;\ y\,(0) = 2$ at $x = 0.4$ with $h = 0.2$ by modified Euler's method **[7M]**

   (b) Using Runge-Kutta method, find $y\,(1.1)$ given that $\frac{dy}{dx} = 3x + y^2;\ y\,(1) = 1.2$ **[7M]**

UNIT – III

5. (a) Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} \frac{dzdydx}{\sqrt{1-x^2-y^2-z^2}}$ **[7M]**

   (b) Evaluate $\int_0^1 \int_{x^2}^{2-x} xydydx$ **[7M]**

6. (a) Evaluate $\int_0^a \int_{x/a}^{\sqrt{(x/a)}} (x^2 + y^2)\,dy\,dx$, by changing to polar coordinates. **[7M]**

(b) If R is the region bounded by the planes $x = 0$, $y = 0$, $z = 1$ and the cylinder $x^2+y^2=1$, evaluate $\iiint_R xyz\,dx\,dy\,dz$ **[7M]**

UNIT – IV

7. (a) Find the directional derivative of $\phi = xy^2+yz^3$ at the point $(1,-2,-1)$ in the direction of normal to the surface $x\log z - y^2 = -4$ at $(-1,2,1)$. **[7M]**

   (b) Using Divergence theorem evaluate $\iint_S \vec{F}.\hat{n}\,ds$ for $\vec{F} = y\,\hat{i} + x\,\hat{j} + z^2\hat{k}$ for the cylindrical region S given by $x^2 + y^2 = a^2$, $z = 0$ and $z = b$. **[7M]**

8. (a) Prove that $\nabla \times \nabla \times \vec{F} = \nabla\left(\nabla \cdot \vec{F}\right) - \nabla^2\vec{F}$

   [7M]

   (b) If $\vec{F} = 3y\,\hat{i} - xz\,\hat{j} + y\,z^2$ and S is the surface of the paraboloid $2z = x^2 + y^2$ bounded by $z = 2$, using Stokes theorem evaluate $\iint_S curl\,\vec{F}\cdot\hat{n}\,ds$ **[7M]**

UNIT – V

9. (a) i. If m and n are real constants greater than -1, prove that $\int_0^1 x^m(\log x)^n dx = \frac{(-1)^n}{(m+1)^{n+1}}\Gamma(n+1)$

   [7M]

   ii. Evaluate $\int_0^1 x^4\left(\log\frac{1}{x}\right)^3 dx$

   (b) Prove that $J_{1/2}(x) = \sqrt{\frac{2}{\pi x}}\sin x$ and show that $\int_0^{\pi/2}\sqrt{x}\,J_{1/2}(2x)\,dx = \frac{1}{\sqrt{\Pi}}$ **[7M]**

10. (a) If α and β are the two distinct roots of $J_n(x) = 0$, then show that $\int_0^1 x\,J_n(\alpha x)\;J_n(\beta x)\;dx = 0$

    [7M]

    (b) Prove that $x\,J_n'(x) = n\,J_n(x) - x\,J_{n+1}(x)$ **[7M]**

Hall Ticket No | | | | | | | | | | | Question Paper Code: AHS005

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Regular) - December, 2016

Regulation: IA – R16

ENGINEERING CHEMISTRY

(Common for all branches)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Describe the construction and working of lead - acid storage battery. Give the reactions that occur during discharge. Mention its applications. **[7M]**

   (b) Write the cell representation and calculate the EMF for the cell reaction: **[7M]**
   $Zn_{(s)} + Fe^{2+}(0.005) \leftrightarrow Zn^{2+}(0.01\ M) + Fe_{(s)}. Given,\ E^0$ values of iron and zinc are -0.44 V and -0.76 V respectively.

2. (a) Derive the Nernst equation for a single electrode potential. **[7M]**

   (b) What is a reference electrode? Give the construction and working of calomel electrode with reactions. **[7M]**

UNIT – II

3. (a) What are the different reactions taking place at the cathode during corrosion? How do cathodic inhibitors work to reduce the rate of these reactions (Mention any two)? **[7M]**

   (b) Explain the process of tinning and galvanizing with example. **[7M]**

4. (a) What is cathodic protection? Explain the sacrificial anode method of protection. **[7M]**

   (b) Discuss the effect of the following factors on rate of corrosion **[7M]**
   i. Nature of metal
   ii. Nature of environment

UNIT – III

5. (a) Explain the determination of hardness of water by complexometric method. **[7M]**

   (b) A sample water of 100 ml required 12.6 ml of 0.02 M EDTA solution with EBT as indicator and 8.4 ml of 0.02 M EDTA for the same volume of water after removing the carbonate hardness. Calculate the total, permanent and temporary hardness in terms of calcium carbonate equivalents. **[7M]**

6. (a) Compare and contrast the temporary and permanent hardness of water. **[7M]**

   (b) Calculate temporary and permanent hardness of a water sample which contains 6.8mg of $CaSO_4$, 33mg of $CaCl_2$, 40mg of Na_2SO_4, 24mg of $MgSO_4$ per liter of the water sample. (Given Molar mass of Ca=40g, Na=23g, Mg=24g, S=32g, O=16g, Cl=35.0g) **[7M]**

UNIT – IV

7. (a) Differentiate addition and condensation polymerisation. Give suitable examples. **[7M]**

   (b) What are refractories? Explain how they are classified and give atleast two advantages. **[7M]**

8. (a) Define and differentiate thermoplastic and thermosetting polymers (any 5 points). Give an example for each type **[7M]**

   (b) What is cement? Discuss the merits and demerits of dry and wet process for the manufacture of Portland cement. **[7M]**

UNIT – V

9. (a) What is cracking? Explain the process of fixed bed catalytic cracking of petroleum. **[7M]**

   (b) Explain Ultimate analysis of coal along with its significance **[7M]**

10. (a) Describe fractional distillation of petroleum mentioning the components, composition, boiling point ranges and applications. **[7M]**

    (b) A sample of coal was found to have the following % composition by weight. C = 70%, H= 6%, O = 14%, N=5% and rest is ash. Calculate GCV and NCV. **[7M]**

Hall Ticket No | | | | | | | | | | | Question Paper Code: AHS006

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Regular) - December, 2016

Regulation: IARE – R16

ENGINEERING PHYSICS

(Common for CSE/IT/ECE/EEE)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) What is internal field in a dielectric? Obtain an expression for internal field for a one dimensional array of dipoles and extend it to a cubic solid. **[7M]**

   (b) Explain the mechanisms of ionic and orientation polarization. Which one of them does not depend on temperature? **[7M]**

2. (a) Distinguish between para and diamagnetism. Give one example for each class of material. **[7M]**

   (b) Define magnetic field intensity (H) and magnetic induction (B). Derive relation between B&H. **[7M]**

UNIT – II

3. (a) Explain the construction of working ruby laser with energy level diagram **[7M]**

   (b) What is ratio of populations of the two energy levels correspondence to the lasing wavelength of 694.3nm in ruby laser **[7M]**

4. (a) Define the term laser. What are the characteristics of laser beam ? **[7M]**

   (b) Describe the construction of He-Ne laser and explain its working with the help of energy level diagram. **[7M]**

UNIT – III

5. (a) Compare the surface to volume ratios of a spherical object when the size (radius) is reduced from 1000 cm to 1 nm. **[7M]**

   (b) What are the causes for drastic changes in properties of a material when its size is reduced to the nanoscale? Explain. List some important applications of nano materials. **[7M]**

6. (a) Outline the sol gel and chemical vapour deposition techniques for the preparation of nano materials with emphasis on the merits of each process **[7M]**

   (b) What are the main parts of a transmission electron microscope? Explain the working of a TEM and list the applications of TEM. **[7M]**

UNIT – IV

7. (a) Obtain the wave function for a particle in an infinite potential well along with normalization condition. Specify wave function, energy and the probability densities for the ground and first two excited **[7M]**

   (b) An electron is in the ground state in an infinite potential well of width $5A^0$, calculate the excitation energy required to raise the electron to the third excited state. **[7M]**

8. (a) Setup the time independent one dimensional Schrödinger wave equation. **[7M]**

   (b) Explain the deBroglie hypothesis and derive expression for deBroglie wavelength. Calculate the deBroglie wavelengths of a photon and a proton having energy of 100 eV (Mass of proton $=1.67 \times 10^{-27} kg$). **[7M]**

UNIT – V

9. (a) Calculate the Hall coefficients in semiconductors with carrier densities equal to **[7M]**
   i. $1.9 \times 10^{14}/cm^3$
   ii. $1.6 \times 10^{17}/cm^3$

   (b) Determine the Fermi energy in the following cases with suitable energy level diagrams **[7M]**
   i. Intrinsic semiconductor
   ii. P-type semiconductor
   iii. n-type semiconductor

10. (a) What is the hall effect? Obtain the expression for hall coefficient. **[7M]**

    (b) Mobilities of electrons and holes in a sample of intrinsic germanium at 300K are $0.36 m^2 V^{-1} s^{-1}$ and $0.17 m^2 V^{-1} s^{-1}$ respectively. If the resistivity of the specimen is $2.12 \Omega - m$, compute the forbidden energy gap for germanium. **[7M]**

Hall Ticket No | | | | | | | | | | | Question Paper Code: AHS007

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Regular) - December, 2016

Regulation: IARE – R16

APPLIED PHYSICS

(Common for AE/CE/ME)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Using a suitable diagram explain why when a dielectric is placed in a uniform electric field, the field within the dielectric weakens? **[7M]**

   (b) A parallel plate capacitor having vacuum between the plates is charged such that the surface charge density on the plates is $8 \times 10^4 C/m^2$. If a dielectric is now inserted between the plates it is found that the surface charge density on the dielectric is $6 \times 10^4 C/m^2$. What is the dielectric constant of the material **[7M]**

2. (a) Draw a typical hysteresis curve for a ferromagnetic specimen and explain it using the domain theory. **[7M]**

   (b) An empty solenoid having a current of 1A produces a magnetic field of 0.25T at a point along the axis outside the solenoid. If a specimen is now introduced inside the solenoid then the magnetic field at the same point on the axis of the solenoid is 25T. What is the susceptibilty of the specimen? **[7M]**

UNIT – II

3. (a) State four factors affecting acoustics of an auditorium and give possible remedies **[7M]**

   (b) A cubical hall of dimension L has a reverberation time T. If the size of the hall is shrunk so that the new dimension is $L/3$, what will be the change in the reverberation time? **[7M]**

4. (a) Describe how ultrasonic waves can be produced by the method of magnetostriction? **[7M]**

   (b) A material of thickness t, Young's modulus Y and density d produces ultrasonic waves of frequency f. What will be the frequency of the ultrasonic waves produced by another material of thickness $t/2$, Young's modulus 3Y and density 2d in terms of frequency f. **[7M]**

UNIT – III

5. (a) Two coplanar forces A and B act at a point on a body. Assuming that the angle between the forces is θ, derive an expression for the resultant. If the resultant makes an angle α with the force A, write an expression for α. **[7M]**

   (b) A block of mass M=15kg hangs by a cord from a knot K of mass m_k. This knot hangs from the ceiling by means of two cords A and B. If the magnitude of the gravitational force on the knot is negligible compared to the gravitational force on the block, calculate the tension in cord C given in figure 1. **[7M]**

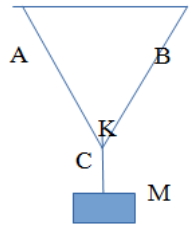

Figure 1

6. (a) A uniform horizontal bar is pivoted at its centre of mass. Two forces A and B at distances x_1 and x_2 of the centre (on either side of the centre) act down wards. What will be the ratio of x_1 to x_2, if the bar is to remain horizontal? Explain your result. **[7M]**

   (b) Three concurrent forces act a point shown in figure 2. If $F_1 = 2$N, $F_2 = 3$N, find the magnitude of F_3 assuming that the point is in equilibrium. **[7M]**

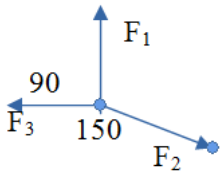

Figure 2

UNIT – IV

7. (a) What is friction explain the importance and nature of friction.Explain the coefficient friction. **[7M]**

   (b) A body slides along down a surface(with a uniform speed) that is inclined at an angle θ with respect to the horizontal. If the mass of the body is M and the coefficient of friction between the body and the surface is μ then derive a relationship between the coefficient of friction and the angle **[7M]**

8. (a) How to get solution of problems involving frictional forces with two good examples in detail. **[7M]**

   (b) A block weighing 10 KN is kept on a rough horizontal surface,the coefficient of static friction between the block and horizontal forces is required to start the block moving. **[7M]**

UNIT – V

9. (a) State perpendicular axis theorem. If the moment of inertia of a rectangular plate perpendicular to its length is $ML^2/12$ and perpendicular to the breadth is $MB^2/12$ then what is the moment of inertia about the axis passing through the centre of mass and perpendicular to the plane of the plate? **[7M]**

   (b) Obtain an expression for the radius of gyration of a rod of length L about an axis passing through one end of the rod and perpendicular to the length of the rod **[7M]**

10. (a) Explain the terms torque and angular momentum. Derive relation between torque and angular momentum. **[7M]**

    (b) The moment of inertia of a rectangular plate of mass 1 kg is $5 \times 10^{-4} kg\ m^2$ about an axis passing through the centre and is perpendicular to the plane of the lamina. The moment of inertia about an axis passing through midpoint and length is $4 \times 10^{-4} kg\ m^2$ Calculate the dimensions of the rectangular plate. **[7M]**

Hall Ticket No | | | | | | | | | | | Question Paper Code: ACS001

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Regular) - December, 2016

Regulation: IARE-R16

COMPUTER PROGRAMMING
(Common for CSE/IT/ECE/EEE)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) What do you mean by type conversion? When it is required? Explain with suitable example. **[7M]**

   (b) The Scalene triangle is one category of triangles which have 3 unequal sides and 3 unequal angles. Assume that user inputs 2 sides and the in between angle. Write a C program to compute area for this scenario using the formula. **[7M]**
   $k = ab\,(sin\,(c)\,/2)$

2. (a) Explain how evaluation of expression takes place in computer. Evaluate the following expression: $i = 2 * 3/4 + 4/4 + 8 - 2 + 5/8$ **[7M]**

   (b) If a five-digit number is input through the keyboard, write a C program to print a new number by adding one to each of its digits. For example if the number that is input is 12391 then the output should be displayed as 23402. **[7M]**

UNIT – II

3. (a) While purchasing certain items, a discount of 10% is offered if the quantity purchased is more than 1000. If quantity and price per item are input through the keyboard, write a C program to calculate the total expenses. **[7M]**

   (b) Write a C program to reverse a input string given by user (without using string library functions). **[7M]**

4. (a) In number theory, the prime factors of a positive integer are the prime numbers that divide that integer exactly. For instance 2 and 5 are the prime factors of 10. Write a C program to enter any number and find all Prime factors of the number. **[7M]**

   (b) Write a C program that computes frequency of characters in a string i.e. which character is present how many times in a string. For example in the string "code" each of the character 'c', 'o', 'd', and 'e' has occurred one time. Only lower case alphabets need to be considered for counting and other characters (uppercase and special characters) must be ignored. **[7M]**

UNIT – III

5. (a) Define a macro MIN and MAX that gives the minimum and maximum of two values. Then write a C program to test the macro definition. **[7M]**

   (b) Write a function called arraySum that takes two arguments: an integer array and the number of elements in the array. Have the function return as its result the sum of the elements in the array. **[7M]**

6. (a) Write a C program to pass an array containing age of person and number of persons to a function. This function should find average age and display the average age in main function. **[7M]**

   (b) Write a c program to swap three integers in cyclic order using call by reference. **[7M]**

UNIT – IV

7. (a) How Structure and unions are assigned memory? Explain with diagram. **[7M]**

   (b) Write a function elapsed_time that takes as its arguments two time structures and returns a time structure that represents the elapsed time (in hours, minutes, and seconds) between the two times. **[7M]**

8. (a) What is structure variable? Can a structure variable be defined as member of another structure? Explain with example. **[7M]**

   (b) Write a C program which asks the user to enter today's date and calculates tomorrow's date and display the results. **[7M]**

UNIT – V

9. (a) Is it possible to pass arguments to C programs when they are being executed? Justify. **[7M]**

   (b) Write a C program to write name and height of five students using an array of structures to a file via fwrite(). Further, the program must read the array from the file and display on the screen. **[7M]**

10. (a) What is EOF? How can we read a file, if it has multiple EOF characters? Compare with examples the text file and binary file. **[7M]**

    (b) Write a program that merges lines alternately from two files and writes the results to new file. If one file has less number of lines than the other, the remaining lines from the large file should be simply copied into the target file. **[7M]**

Hall Ticket No | | | | | | | | | | | Question Paper Code: AME001

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Regular) - December, 2016

Regulation: IARE-R16

ENGINEERING DRAWING
(Common for CE/ME)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Construct a scale of 1:50 to read metres and decimeters and long enough to measure up to 6 m. Mark on it a distance of 5.5 m. **[7M]**

   (b) Construct an ellipse with its foci 40 mm apart and the major axis (distance between the vertices) as 70 mm. Draw a tangent to the curve at a point 20 mm from the focus. **[7M]**

2. A circle of 40 mm diameter rolls on a horizontal line for one complete revolution without slipping. Trace the path of a point on the circumference of circle. Name the curve. **[14M]**

UNIT – II

3. A line PQ 80 mm long is inclined at 30^0 to VP and 45^0 to HP. The point P is 10 mm above HP and 20 mm in front of VP. Draw the projection of the line and find the apparent angle of the line with both HP and VP. Also locate the traces. **[14M]**

4. A hexagonal lamina of 30 mm side rests with one of its corners on HP, such that the two edges passing through the corner make equal inclinations with HP. The surface of the lamina is inclined at 30^0 to HP. The diagonal passing through the corner on which the lamina rests, appears to be inclined at 45^0 to VP. Draw the front and top views of the lamina in its final position. Also determine the true inclination of the diagonal with VP. **[14M]**

UNIT – III

5. A triangular pyramid of 30 mm base side and axis 50 mm long rests with one of its base edges on HP. Its axis is inclined at 30^0 to HP and top view of the axis appears to be inclined at 45^0 to VP. Draw the projections of the pyramid and determine the true inclination of the axis with VP. **[14M]**

6. A right cylinder of 30 mm base diameter and height 70 mm is resting on a point in the base circumference, on HP, such that the axis of the cylinder is inclined at 60^0 to HP and the top view of the axis appears to be inclined at 45^0 to VP. Draw the projection of the cylinder and determine the true inclination of the axis with VP. **[14M]**

UNIT – IV

7. A pentagonal prism of 30 mm base side and height 65 mm is resting on its base on HP, such that one of its base edges is parallel and near to VP. A section plane passes through a point on the axis 30 mm above the HP and is inclined at 45^0 to HP. Draw the development of the lateral surface of the truncated prism. **[14M]**

8. Draw the isometric projection of the block shown in Figure 1 **[14M]**

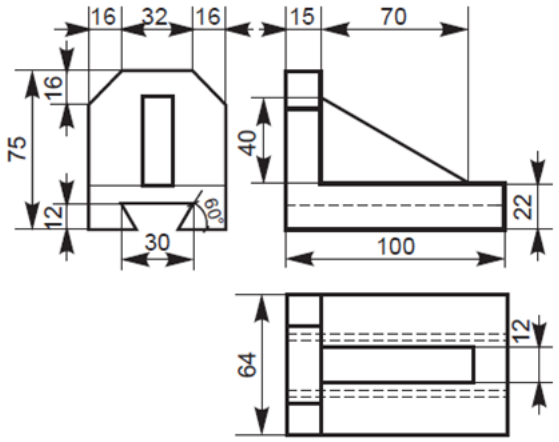

Figure 1

UNIT – V

9. Draw the front view ,top view and left side view of the block shown in Figure 2 **[14M]**

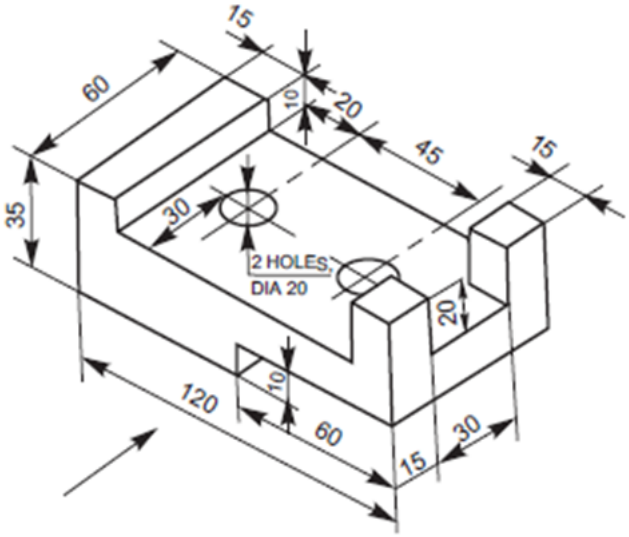

Figure 2

10. Draw the plan, elevation and side view viewed from left side of the block shown in Figure 3 **[14M]**

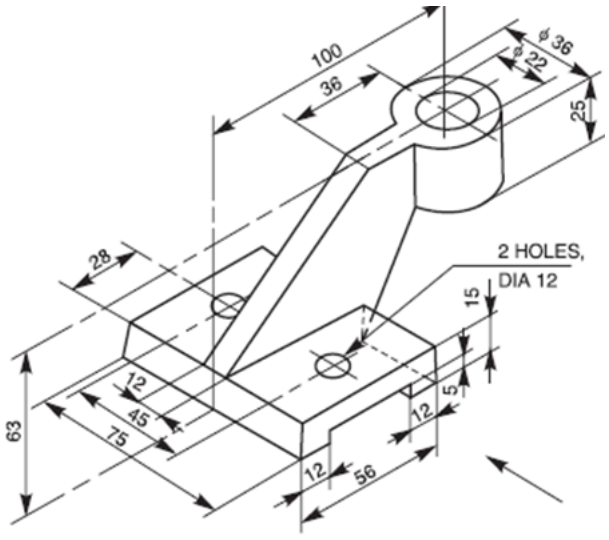

Figure 3

Hall Ticket No | | | | | | | | | | | Question Paper Code: AME001

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Regular) - December, 2016

Regulation: IARE-R16

ENGINEERING DRAWING

(Aeronautical Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) The distance between two towns is 250 km and is represented by a line of length 50 mm on a map. Construct a scale to read 600 km and indicate a distance of 530 km on it. **[7M]**

   (b) Construct a parabola with the distance of the focus from the directrix at 50 mm, using eccentricity method. Draw a tangent and normal through a point 40 mm from the directrix. **[7M]**

2. A circle of 40 mm diameter rolls outside another circle of diameter 150 mm for one revolution without slip. Trace the locus of a point on the circumference of the rolling circle for one complete revolution. Name the curve and draw a tangent and normal at any point on the curve. **[14M]**

UNIT – II

3. A line MN has its end M, 15 mm above HP and 10 mm in front of VP. The end N is 55 mm above HP and the line is inclined at 30^0 to HP. The distance between the end projectors of the line, when measured parallel to the XY- line, is 50 mm. Draw the projections of the line and find its inclination with VP. Also locate the traces. **[14M]**

4. Draw the top and front views of a circular lamina of diameter 60 mm, resting with a point of its circumference on HP, and its surface inclined at 35^0 to HP. The diameter passing through the point, on which the lamina rests, appears to be inclined at 45^0 to VP. Also determine the true inclination of the diameter with VP. **[14M]**

UNIT – III

5. A pentagonal pyramid of 25 mm base side and axis 55 mm long rests with one of its base corner on HP. The base edges passing through the points on which it rests makes equal inclination with HP and the slant edge passing through the corner on which it rests is inclined at 45^0 to HP. The top view of the axis of the pyramid appears to be inclined at 60^0 to VP. Draw the projections of the pyramid and determine the true inclination of the axis with VP. **[14M]**

6. A right cone of 30 mm base diameter and height 70 mm is resting on one of its generators on HP and the axis of the cone is inclined at 45^0 to VP. Draw the projection of the cone. **[14M]**

UNIT – IV

7. A hexagonal prism of 30 mm base side and height 65 mm is resting on its base on HP, such that one of its base edges is parallel to VP. The prism has a circular through hole of diameter 20 mm and hole axis passes through the axis of the prism at height of 35 mm above HP and perpendicular to VP. Draw the development of the lateral surface of the truncated prism. **[14M]**

8. Draw the isometric projection of the block shown in Figure 1 **[14M]**

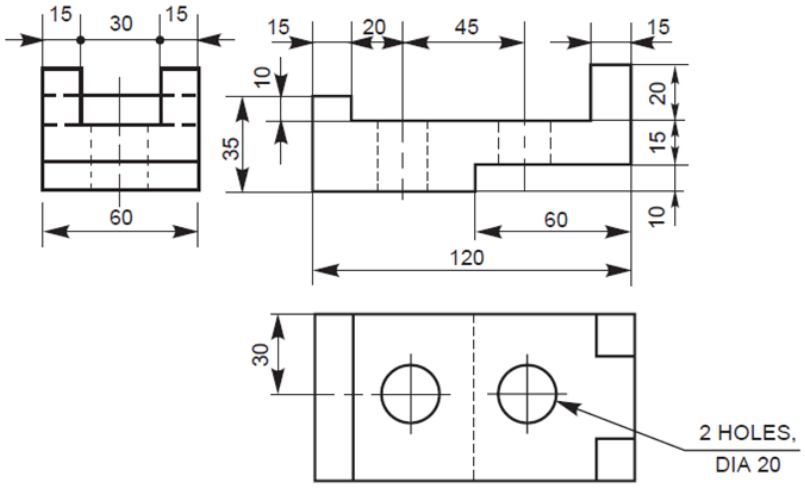

Figure 1

UNIT – V

9. Draw the front view ,top view and left side view of the block shown in Figure 2 **[14M]**

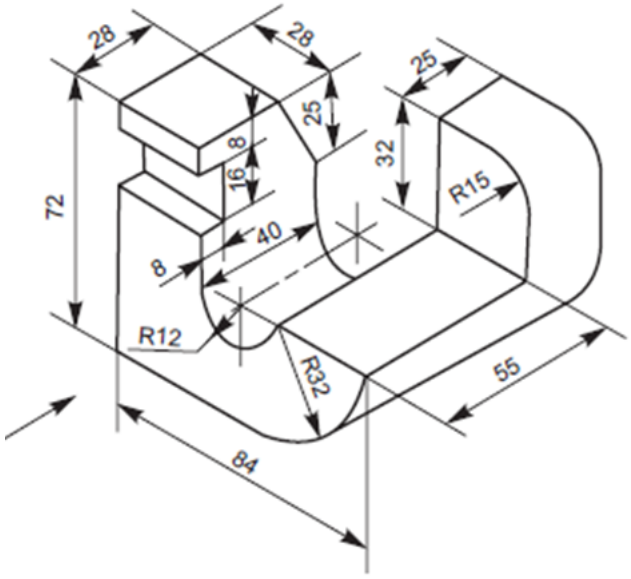

Figure 2

10. Draw the plan, elevation and side view viewed from right side of the block shown in Figure 3 **[14M]**

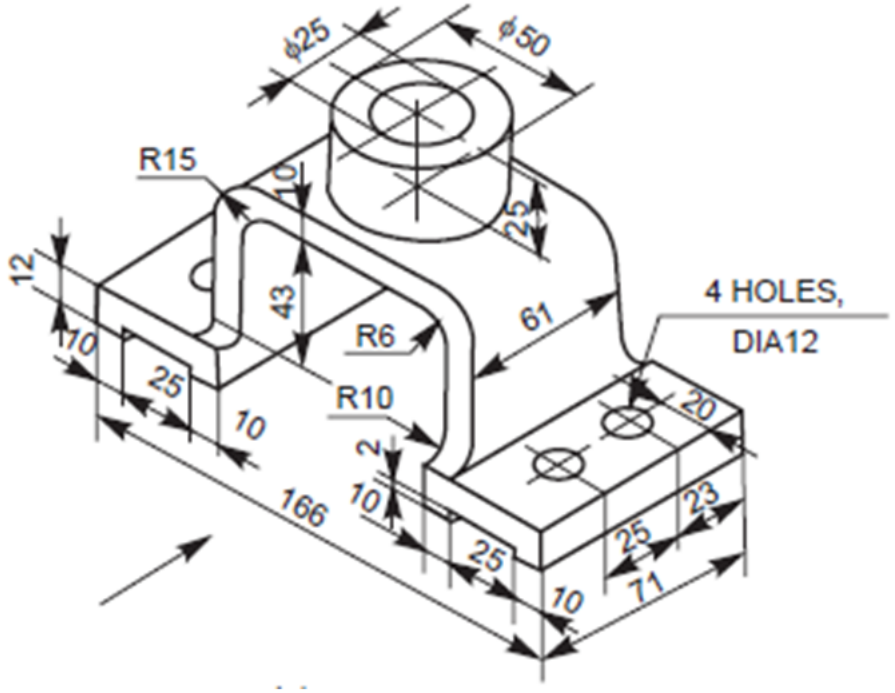

Figure 3