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Question Paper Code: AHS001



INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech I Semester End Examinations (Supplementary) - January, 2017

Regulation: IARE-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) Write about common barriers to listening. [7M]
(b) Write about global versus local listening. [7M]
2. (a) How to listen for general content and note taking? [7M]
(b) Write about Empathetic listening and Critical listening [7M]

UNIT – II

3. (a) Define a dialogue. Create a dialogue between an employer and an employee regarding work performance. [7M]
(b) List the barriers in effective speaking skills. [7M]
4. (a) How can you improvise your speaking abilities? [7M]
(b) What are the criteria's required for a good presentation skill. [7M]

UNIT – III

5. (a) How does Reading help to become an excellent communicator? [7M]
(b) Explain the different techniques of reading. [7M]
6. (a) What are the strategies involved in improving Reading skills. [7M]
(b) Do you think technology has affected our reading skills? Elaborate your answer. [7M]

UNIT – IV

7. (a) What are the merits of oral form of communication? [7M]
(b) imagine you are the cultural coordinator of your college. Draft an email to all the members of the cultural team asking them to attend a meeting that you arrange so as to discuss about the upcoming events. [7M]
8. (a) What are the guidelines to be kept in mind while constructing paragraphs? [7M]
(b) Construct two paragraphs on the given topic with minimum 200 words- Topic: Reading skills in the era of Technology [7M]

UNIT – V

9. Write about any four types of nouns and verbs giving examples. Define each type of noun and verb. [14M]
10. (a) “Shall” and “Will” as modal verbs. Explain with examples in different tenses. [7M]
(b) Explain Direct speech with suitable examples [7M]

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INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Supplementary) - January, 2017

Regulation: IARE-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) Solve the equation $x \tan x = -1$ by Regula-falsi method between 2.5 and 3. Correct the root to 3 decimals. [7M]

- (b) Using suitable central difference formula, find $f(35)$ for the following data [7M]

x	20	30	40	50	60
f(x)	512	439	346	243	140

2. (a) Using Regula – Falsi method, find a real root of the equation, $xe^x = \cos x$ that lies between 0.4 and 0.6 (x in radians). Correct the root to three decimals. [7M]
- (b) Certain corresponding values of x and $\log_{10} x$ are given below. (300, 2.4771), (304, 2.4829), (305, 2.4843) and (307, 2.4871). Find $\log_{10}(301)$ using Lagrange's interpolation.

UNIT – II

3. (a) Fit a law of the form $V = a + \left(\frac{b}{A}\right)$ for the following data and hence compute V when a=12. [7M]

V	50	47	46	45	44
A	2	3	4	6	10

- (b) Solve $y' = 2y + 3e^x, y(0) = 0$ To find $y(0.1), y(0.2)$ by Taylor Series method. [7M]
4. (a) At a Constant temperature Pressure(P) and a Volume(V) of a gas are corrected by the Relation $PV^\gamma = \text{constant}$. Find the best fitting equation of this form to the following data and estimate V where P = 4 [7M]

P	0.5	1.0	1.5	2.0	2.5	3.0
V	1620	1000	750	620	520	460

- (b) Using Modified Euler's method, solve $y' = \log(x + y), y(1) = 2$ at $x = 1.2$ & 1.4 [7M]

UNIT – III

5. (a) Evaluate $\int\int_R y dx dy$ where R is the region enclosed by the parabola $x^2 = y$ and the line $y = x + 2$ [7M]
- (b) Evaluate $\int_0^{\pi^2} \int_0^{a \sin \theta} \int_0^{\frac{a^2-r^2}{a}} r dr d\theta dz$ [7M]
6. (a) Find the area bounded by the curves $xy = 2$, $4y = x^2$ and the line $y=4$. [7M]
- (b) Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz dy dx$ [7M]

UNIT – IV

7. (a) Find the constants ‘a’ and ‘b’ so that $\vec{f} = (axy + z^3) i + (3x^2 - z) j + (bxz^2 - y) k$ is irrotational and find ϕ such that $\vec{f} = \nabla\phi$ [7M]
- (b) Verify Green’s theorem for $\int_C (3x^2 - 8y^2) dx + (4y - 6xy) dy$ where ‘C’ is the boundary of the region by the curves $y = \sqrt{x}$ and $y=x^2$. [7M]
8. (a) Using divergence theorem evaluate $\iiint_S \vec{F} \cdot \hat{n} ds$, where $\vec{F} = 4x \hat{i} - 2y^2 \hat{j} + z^2 \hat{k}$ and is the surface enclosed by $x^2 + y^2 = 4$, $z = 0$ and $z = 3$. [7M]
- (b) Using Stokes theorem evaluate $\int_C (\sin z dx - \cos x dy + \sin y dz)$, where C is the boundary of the rectangle $0 \leq x \leq \pi$, $0 \leq y \leq 1$, $z = 3$ [7M]

UNIT – V

9. (a) Using generating functions for $J_n(x)$, prove the following Jacobi series [7M]
- i. $\cos(x \sin \theta) = J_0 + 2J_2 \cos 2\theta + 4J_4 \cos 4\theta + \dots$
- ii. $\sin(x \sin \theta) = 2J_1 \sin \theta + 2J_3 \sin 3\theta + 2J_5 \sin 5\theta + \dots$
- (b) Show that $\int_0^\infty \sqrt{y} \cdot e^{-y^2} dy \cdot \int_0^\infty \frac{e^{-y^2}}{\sqrt{y}} dy = \frac{\pi}{2\sqrt{2}}$
10. (a) Prove that $2nJ_n(x) = x \{J_{n+1}(x) + J_{n-1}(x)\}$ [7M]
- (b) Use Frobenius method to solve $2x(1-x)y'' + (1-x)y' + 3y = 0$ [7M]

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Question Paper Code: AHS005



INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech I Semester End Examinations (Supplementary) - January, 2017

Regulation: IARE-R16

ENGINEERING CHEMISTRY
(Common to 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) What is a galvanic cell? Explain the construction and working of galvanic cell with a suitable example. [7M]
- (b) A conductance cell containing 0.01 N KCl solution at 25°C gave a resistance of 1250 ohms. If the specific conductivity of the solution is $0.0014087 \text{ ohm}^{-1} \text{ cm}^{-1}$ and the distance between the electrodes is 1.2 cm. Calculate [7M]
 - i. cell constant and
 - ii. equivalent conductance.
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) Explain the mechanism of corrosion by electrochemical theory. [7M]
- (b) Write a note on anodic and cathodic metal coatings. [7M]
4. (a) Write a brief note on Chemical corrosion (Oxidation corrosion). [7M]
- (b) What is cathodic metal coating? Describe tinning process of protecting iron sheet from corrosion. Why are tin coated iron sheets used in making containers used for storing food stuffs? [7M]

UNIT – III

5. (a) Describe the determination of dissolved oxygen by Winkler's method. [7M]
- (b) 50 ml of hard water sample required 18.5 ml of M/50 EDTA solution at the end point using EBT as indicator. The same volume of water after boiling and filtering, the filtered water required 12.3 ml of the same EDTA at the end point with the same indicator. Calculate the total, permanent, and temporary hardness of water. [7M]

6. (a) What is potable water? Discuss the principle and the process involved in the purification of water by reverse osmosis method. [7M]
- (b) Write a brief note on zeolite process .Why is calgon conditioning is better than phosphate conditioning? [7M]

UNIT – IV

7. (a) Write the synthesis, properties and applications of PVC and Teflon. [7M]
- (b) Define the term vulcanization of rubber. Mention its significance. [7M]
8. (a) Write a note on compounding of plastics and their functions. [7M]
- (b) Give preparation method and uses of the following polymers: [7M]
- i. Nylon (6,6)
 - ii. Bakelite

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) What is knocking? Explain the mechanism of knocking with relevant equations. [7M]
- (b) A sample of coal was found to have the following composition: C = 75%, H = 5.2 %. O = 12.1 %. N = 3.2 %, and ash = 4.5%. Calculate the amount of oxygen required for complete combustion of coal. [7M]

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INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Supplementary) – February , 2017

Regulation: IARE–R16

LINEAR ALGEBRA AND ORDINARY DIFFERENTIAL EQUATIONS

(Common to 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) Find the rank of the matrix $\begin{bmatrix} 1 & 1 & 1 & 6 \\ 1 & -1 & 2 & 5 \\ 3 & 1 & 1 & 8 \\ 2 & -2 & 3 & 7 \end{bmatrix}$ by reducing it into normal form. [7M]

(b) Find the inverse of the matrix $\begin{bmatrix} 2 & 3 & 1 \\ 1 & 2 & 3 \\ 3 & 1 & 2 \end{bmatrix}$ using elementary row operations. [7M]

2. (a) Find the inverse of $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$ by Gauss – Jordan method. [7M]

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

UNIT – II

3. (a) Find the Eigen values and Eigen vectors of the matrix $\begin{bmatrix} 1 & -1 & 1 \\ 1 & 0 & 0 \\ -1 & 1 & -1 \end{bmatrix}$ [7M]

(b) Find a matrix P such that $P^{-1}AP$ is diagonal matrix, where $A = \begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$ [7M]

4. (a) Show that [7M]
 i. a square matrix A and its transpose A^T have same eigen values
 ii. product of two Unitary matrices is Unitary.

(b) Find a matrix P which diagonalises the matrix $A = \begin{bmatrix} -1 & 1 & 1 \\ 0 & -1 & 2 \\ 1 & 1 & 1 \end{bmatrix}$ [7M]

UNIT – III

5. (a) Solve the differential equation $x \frac{dy}{dx} + (1 - x)y = x^2y^2$ [7M]
 (b) In a murder investigation, a corpse was found by a detective at exactly 8 PM. Being alert, the detective also measured the body temperature and found it to be 70° F. Two hours later, the detective measured the body temperature again and found it be 60° F. If the room temperature is 50° F and assuming that the body temperature of the person before death was 98.6° F, at what time did the murder occur? [7M]
6. (a) Find the orthogonal trajectories of the family of circles passing through the origin and the centres on the x - axis. [7M]
 (b) Solve the differential equation $x(1 - x^2) \frac{dy}{dx} + (2x^2 - 1)y = x^3$ [7M]

UNIT – IV

7. (a) Solve the differential equation $(D^3 - 2D^2 - 5D + 6)y = 0, y(0) = 0, y'(0) = 0, y''(0) = 1$ [7M]
 (b) Solve the differential equation $[(D - 1)^2(D^2 + 1)]y = e^x$ [7M]
8. (a) Solve the differential equation $(D^2 - 5D + 6)y = x \cos x \cos 2x$ [7M]
 (b) A circuit consists of an inductance of 2 Henrys, a resistance of 4 Ohms and capacitance of 0.05 Farads. If $q = i = 0$ at $t = 0$. Find $q(t)$ and $i(t)$ when there is a constant electromagnetic field of 100 V. [7M]

UNIT – V

9. (a) If $U = \left(\frac{y-x}{xy}, \frac{z-x}{xz} \right)$ then find the value of $x^2U_x + y^2U_y + z^2U_z$ [7M]
 (b) Examine the function $\sin x + \sin y + \sin(x + y)$ for extreme values. [7M]
10. (a) Find the extreme values of the function $f(x, y) = x^4 + y^4 - 2x^2 + 4xy - 2y^2$ [7M]
 (b) If x increases at the rate of 2 cm/sec at the instant when $x = 3$ cm, and $y = 1$ cm, at what rate must y be changing in order that $2xy - 3x^2y$ shall be neither increasing nor decreasing? [7M]

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INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Supplementary) - February, 2017

Regulation: IARE-R16

ENGINEERING PHYSICS

(Common to 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

- (a) Explain the phenomenon of electronic, ionic and orientation based on their polarization mechanism with neat diagrams. [7M]

(b) An elemental solid dielectric material has polarizability $7 \times 10^{-40} \text{ Fm}^2$. assuming the internal field to be Lorentz field. Calculate the dielectric constant for the material if the material has $3 \times 10^{28} \text{ atoms/m}^3$. [7M]
- (a) Classify magnetic materials into para, dia and ferro, based on alignment of their magnetic moments and the temperature dependence of susceptibility. [7M]

(b) Explain the origin of magnetic moment based on electron theory. What is Bohr magneton? Obtain an expression for it. [7M]

UNIT – II

- (a) Why is an indirect band gap semiconductor not used in the construction of a semiconductor laser? Explain using an E-K diagram. [7M]

(b) Describe the construction of semiconductor diode laser and explain its working with the help of energy level diagram. [7M]
- (a) Give two examples of semiconductor materials used in the construction laser diodes. What is the band gap of a semiconductor material emitting a laser of wavelength 405 nm? [7M]

(b) Mention the important differences between spontaneous and stimulated emission. Identify the active species/medium and the mechanism by which population inversion is achieved in the case of Ruby, He-Ne and semiconductor lasers. [7M]

UNIT – III

- (a) Explain how different characteristics of nanomaterial can be determined using transmission electron microscopy. What different parameters can be found using this technique? [7M]

(b) Discuss the effect of size reduction to nano scale on any four properties of a material. [7M]

6. (a) How to do the characterization of nanomaterial by XRD. Calculate the wavelength of X-rays which produce a first order maximum at an angle of 22° in a crystal with interplanar distance of 1.5 \AA . [7M]
- (b) Explain quantum confinement nature of the nano material that drastically changes its properties compared to bulk materials. [7M]

UNIT – IV

7. (a) What is the meaning of ψ ? Set up the Schrodinger's time independent wave equation. [7M]
- (b) Calculate the first three energy values for an electron bound in an infinite potential well of width 5 nm. [7M]
8. (a) Obtain the Eigen energy values and Eigen energy functions for a particle bound in an infinite potential well. [7M]
- (b) Calculate the de Broglie wavelengths of an electron and a neutron both traveling at a speed of 10^6 m s^{-1} . [7M]

UNIT – V

9. (a) What is Hall effect? Why do semiconductors exhibit higher Hall coefficient than metals? [7M]
- (b) What is Fermi energy? Show that the Fermi level lies midway between the valence and conduction band in an intrinsic semiconductor. [7M]
10. (a) Write a note on direct and indirect band gap semiconductors. Give two examples for each. Explain why a direct band gap material is used for light emission? [7M]
- (b) Why does the resistance of a semiconductor decrease with increasing temperature? Estimate the electrical conductivity of intrinsic silicon at 300 K, given that the electron and hole mobilities are $\mu_e = 0.15 \text{ m}^2/\text{Vs}$ and $\mu_h = 0.05 \text{ m}^2/\text{Vs}$. The intrinsic carrier concentration is $1.2 \times 10^{16}/\text{m}^3$ at 300 K. [7M]

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Question Paper Code: AHS007



INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech I Semester End Examinations (Supplementary) - February, 2017

Regulation: IARE-R16

APPLIED PHYSICS
(Common to 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

- (a) What are ferromagnetic materials? Discuss the hysteresis of a ferromagnetic material. [7M]
(b) What are the classification and properties of magnetic materials? [7M]
- (a) Explain the different types of magnetic materials. [7M]
(b) An empty solenoid having a current of 1A produces a magnetic field of 0.25 T 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 25 T. What is the susceptibility of the specimen? [7M]

UNIT – II

- (a) Explain the meaning of (i) reverberation and (ii) reverberation time. [7M]
(b) What is coefficient of absorption? Explain the experimental determination of the absorption coefficient of a material. [7M]
- (a) Explain in the application of ultrasonic waves in science, medicine and industry. [7M]
(b) What is SONAR? Explain how ultrasonic waves are used in SONAR. [7M]

UNIT – III

- (a) A rigid body is pulled by three coplanar forces such that the body is static. What can be concluded about the forces and draw a free body diagram for the body and explain. [7M]
(b) Two concurrent coplanar forces A and B make a certain angle with each other. If the resultant R makes an angle α with A and β with B then derive a relation for A and B in terms of R, α and β . [7M]
- (a) What is resultant of a force system explain determination of resultant of two concurrent forces in case of parallelogram law of forces and law of triangle of forces. [7M]
(b) Distinguish between the terms equilibrium and rest. Explain the conditions of equilibrium of coplanar forces system. [7M]

UNIT – IV

7. (a) What is friction explain the importance and nature of friction. [7M]
(b) Explain the coefficient friction. What are the applications of friction? [7M]
8. (a) Give 4 examples to show that friction leads to lesser efficiency. A 1000 kg boat is travelling at 90 kmph when its engine is shut off. The magnitude of the frictional force between the boat and the water is given by $f_k = 70v$ where v is the speed of the boat. Find the time required for the boat to slow to 45 kmph. [7M]
(b) Explain cone of friction force in detail. [7M]

UNIT – V

9. (a) State parallel axis theorem. If the moment of inertia of a circular disc about an axis passing through a diameter is $MR^2/4$, what is the moment of inertia about a tangent to the disc parallel to its plane? [7M]
(b) Derive an expression for the moment of inertia about an axis passing through the centre of mass of a rectangular plate, the axis being perpendicular to the plane of the plate. [7M]
10. (a) The radius of gyration changes with the axis of rotation of a body. Explain . [7M]
(b) Derive an expression for the moment of inertia of a rectangular plate perpendicular to its length and passing through one end parallel to the plane of the plate. [7M]

Hall Ticket No

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Question Paper Code: AME001



INSTITUTE OF AERONAUTICAL ENGINEERING (Autonomous)

B.Tech I Semester End Examinations (Supplementary) - February, 2017

Regulation: IARE-R16

ENGINEERING DRAWING

(Common for CE|ME|AE)

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

- (a) Construct a vernier scale of 1:40,000. Showing kilometers, hectometers and decameters and land enough to measure 5 km. Mark distances of 2.31 km and 3.92 km on the scale. [7M]
(b) A circle of 40 mm diameter rolls along a line for one revolution clock-wise. Draw the locus of a point on the circle, which is in contact with the line. Name the curve. [7M]
- (a) The major and minor axes of an ellipse are 120 mm and 80 mm. Draw an ellipse by Foci or arcs of circles method. [7M]
(b) Draw the involute of a regular hexagon of side 20 mm.

UNIT – II

- Draw the projections and traces of a line AB 100mm long inclined at 30° to HP and 45° to VP. One end is in HP and the other end is in VP. [14M]
- A square lamina PQRS of side 40 mm lies on HP such that the diagonal PR is inclined to HP at 30° and the diagonal QS are inclined to VP at 45° . Draw its projections. [14M]

UNIT – III

- A square pyramid of side of base 40 mm and height 70 mm is resting on one of its slant edges on HP such that the top view of the axis is inclined to VP at 30° . Draw its projection. [14M]
- A rectangular prism of side 30 mm x 50 mm and height 70 mm is resting with one of its shorter edges on HP such that the axis is inclined at 30° to HP and 60° to VP. Draw its projection. [14M]

UNIT – IV

- A hexagonal prism of side of base 30 mm and axis 75 mm long, is resting on its base on HP such that a rectangular face is parallel to VP. It is cut by a section plane, perpendicular to VP and inclined at 30° to HP. The section plane is passing through the top end of an extreme lateral edge of the prism. Draw the development of the lateral surface of the cut prism. [14M]
- A rectangular pyramid of base 40 mm x 25 mm and height 50 mm is placed centrally on a cylindrical slab of diameter 100 mm and thickness 70 mm. Draw the isometric projections of the combination. [14M]

UNIT – V

9. Convert the isometric projection of the given figure 1 into orthographic projections by drawing the front view, top view and side view. (All dimensions are in mm) [14M]

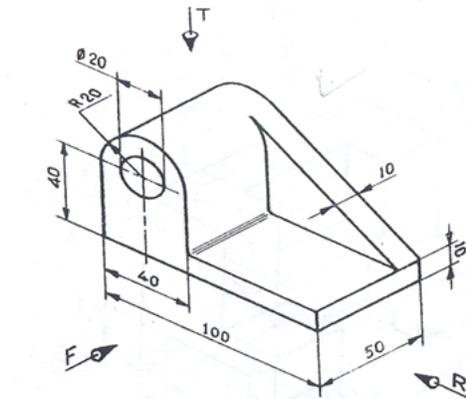


Figure 1

10. Convert the isometric projection of the given figure 2 into orthographic projections by drawing the front view, top view and side view. (All dimensions are in mm) [14M]

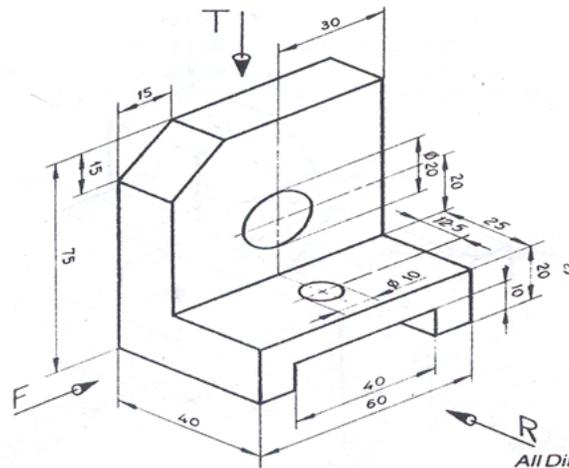


Figure 2

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INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech I Semester End Examinations (Supplementary) - February, 2017

Regulation: IARE-R16

COMPUTER PROGRAMMING

(Common to CSE|EEE|ECE|IT)

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

- What is a flowchart? Develop a flowchart to determine given string is palindrome or not. [7M]
 - The distance between two cities (in km.) is input through the keyboard. Write a program to convert and print this distance in meters, feet, inches and centimeters. [7M]
- Explain briefly Client server computing environment. [7M]
 - Write a C program to accept an integer from user and toggle the nth bit of the given number. Assume the number of bits to be 32. [7M]

UNIT – II

- Discuss briefly the switch case statement in C with its syntax and compare with other conditional control statements. [7M]
 - Assume that you have been given ten words: fortran, java, perl, python, php, javascript, c, cpp, ruby, csharp. Write a C program to take these 10 words from user and sorts elements in lexicographical order. The result must be c, cpp, csharp, fortran, java, javascript, perl, php, python, ruby. [7M]
- Given a $M \times M$ matrix, write a C Program to compute the sum of upper triangular elements. Note that the program must accept the dimension of matrix and elements from the user. [7M]
 - In number theory, a perfect number is a positive integer that is equal to the sum of its proper positive divisors, that is, the sum of its positive divisors excluding the number itself (also known as its aliquot sum). Write a C program to print all Perfect numbers between 1 to n. [7M]

UNIT – III

- Explain different methods for transferring data between calling and called function with an example. [7M]
 - In mathematics, the factorial of a non-negative integer n, denoted by n!, is the product of all positive integers less than or equal to n. Design a recursive C function to compute the factorial of a integer n. Write a test drive for the same. [7M]
- What do you mean by conditional compilation? Explain in detail. [7M]
 - Write a c program to find transpose of a matrix using pointer. [7M]

UNIT – IV

7. (a) Explain the following with suitable example [7M]
i. Library Function
ii. Nested Structure
(b) With suitable example, discuss the functions for allocating and deallocating memory in the Heap. [7M]
8. (a) Explain the following with suitable example [7M]
i. Self Referential Structure
ii. Union
(b) There is a structure called employee that holds information like employee code, name, date of joining. Write a C program to create an array of the structure and enter some data into it. Then ask the user to enter current date. Display the names of those employees whose tenure is 3 or more than 3 years according to the given current date. [7M]

UNIT – V

9. (a) Explain the use of fopen() and fclose() functions. [7M]
(b) Write a C program to copy one file to another. While doing so replace all lowercase characters to their equivalent uppercase characters. [7M]
10. (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 to copy the contents of one file into another using fgetc and fputc function. [7M]