2E2006

2E2006

B. Tech. II Sem. (Main / Back) Exam., May - 2017
206 Fundamentals of Computer Programming

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks Main: 26
Min. Passing Marks Back: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

UNIT – I

Q.1 (a) Describe the structure of C Program in detail.   [8]

   (b) What do you understand by Precedence of operator? How it is considered in expression evaluation?   [8]

OR

Q.1 (a) Describe the arithmetic and logical operator available in C Language.   [8]

   (b) Explain following with suitable example:

   (i)   Basic Data types   [2]

   (ii) Scope of variable   [2]

   (iii) Type casting   [2]

   (iv) Identifiers   [2]

UNIT – II

Q.2 (a) Write a C Program to reverse an inputted integer number, e.g. if input is 2375 then output is 5732. [10]

(b) Write syntax of switch case decision making statement. [6]

OR

Q.2 (a) What are command line arguments? Explain with example. [6]

(b) Write a C program to multiply two matrices. [10]

UNIT – III

Q.3 What do you understand by file handling? Enumerate and explain various file handling functions used in C language. [16]

OR

Q.3 (a) What is structure? Explain. [6]

(b) What do you understand by dynamic memory allocation? [5]

(c) Explain typedef. [5]

UNIT – IV

Q.4 (a) Write a C program using function to display first n numbers of a Fibonacci series. [8]

(b) What is function? Explain call by value and call by reference with example. [8]

OR

Q.4 (a) Define and explain pointers in C language. [6]

(b) What is void pointer? Discuss its uses. [5]

(c) Discuss pointer to structure. [5]

UNIT – V

Q.5 Explain:

(a) Primary memory and secondary storage. [6]

(b) Representing algorithm through flow chart [5]

(c) Random, direct ad sequential access method [5]

OR

Q.5 Convert following:

(a) $(123.63)_{10} = (?)_2$ [4]

(b) $(111.0001)_2 = (?)_{16}$ [4]

(c) $(A B2OC.00C)_{16} = (?)_{10}$ [4]

(d) $(1010.267)_8 = (?)_2$ [4]

2E1024

B. Tech. I Year II Sem. (Old Back) Exam., May - 2017
2008-09 Batch
Environmental Engineering & Disaster Management

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks Main: 26
Min. Passing Marks Back: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. <u>NIL</u> _____   2. <u>NIL</u> _____

UNIT – I

Q.1 (a) Define Disasters. Give their types with detail.   [10]

(b) Give an account on Environmental Hazards.   [6]

OR

Q.1 (a) Explain in detail the national & manmade disasters.   [10]

(b) Write short notes on –   [3×2=6]

(i) Landslide

(ii) Chemical Hazards

UNIT – II

Q.2 (a) What do you mean by disaster vulnerability? [8]

(b) Give a detail on the response, rehabilitation & recovery. [8]

OR

Q.2 (a) Write notes on – [4+4=8]

(i) Flood

(ii) Preparedness for disaster.

(b) Explain Mitigation and Prevention of disaster. [8]

UNIT – III

Q.3 (a) What are seismic waves? Explain. [8]

(b) Discuss about Plate Tectonic Theory of Earthquake [8]

OR

Q.3 (a) What are earthquake energy? Write an account on their causes. [8]

(b) Write notes on epicenter and epicentral distance. [8]

UNIT – IV

Q.4 (a) Explain effect of earthquake on structures. [8]

(b) Discuss the fire resistant structures. [8]

OR

Q.4 Write short notes on –

(a) Basic concepts of earthquake [8]

(b) Effect of cyclone on structures [8]

UNIT – V

Q.5 (a) What are the legislative responsibilities on the disaster management? [10]

(b) What are Do's & Don'ts for prevention of life due to earthquake? [6]

OR

Q.5 Explain various prevention of life measures from disaster like cyclone & tsunami, in detail. [16]

2E1026

2E1026
B. Tech. II Sem. (Old Back) Exam., May - 2017
Common for All Branch
206 Engineering Chemistry - II

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks Main: 26
Min. Passing Marks Back: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. <u>NIL</u> _____   2. <u>NIL</u> _____

UNIT – I

Q.1 (a) How metallurgical coke is manufactured by Otto-Hoffmann's by product coke oven process? [10]

   (b) What are the advantages of gaseous fuel over solid and liquid fuel? Give one example of gaseous fuel with its calorific value. [6]

OR

Q.1 (a) Describe Fischer Tropsch's process for the manufacture of synthetic petrol. [10]

   (b) What is knocking and Octane number? Give names of two antiknocking substances. [6]

UNIT – II

Q.2 (a) Derive complete formula for determining calorific value of a solid fuel by bomb calorimeter. [10]

(b) Calculate the mass of air required for complete combustion of 5 kg of coal containing 80% carbon, 15% hydrogen and rest is oxygen, if 40% excess air is supplied. [6]

OR

Q.2 (a) Write short notes on any two of the following: [5+5]

(i) Significance of proximate analysis

(ii) Delong's formula for calorific value of a fuel.

(iii) Combustion: Write balanced equation for the combustion of methane, acetylene and Hydrogen gases.

(iv) Importance of ultimate analysis.

(b) The ultimate analysis of a coal sample gives :

C = 84%

O = 8.4%

H = 5.5 %

S = 1.5%

N = 0.6%

Calculate the higher (Gross) and lower (Net) calorific values of the sample. [6]

UNIT – III

Q.3 State and explain phase rule of one component system with diagram, taking water system as an example [16]

OR

Q.3 Describe the application of phase rule to Ag – Pb system with the help of diagram. What is Eutectic point? [16]

UNIT – IV

Q.4 (a) What are type – I and type – II super – conductors? Write important applications of superconductors. [10]

(b) Discuss the structure of C_{60} fullerenes. [6]

OR

Q.4 (a) What are organic electronic material? How conjugated Π – electrons are used for conductivity in poly-aniline, poly-pyrrole, and poly-acetylene. [10]

(b) Discuss the principle and working of optical fibres. [6]

UNIT – V

Q.5 (a) What is corrosion? Describe in detail the electrochemical (wet) corrosion of metals. [10]

(b) Explain cathodic protection to prevent corrosion. [6]

OR

Q.5 (a) What is corrosion? Describe in detail the chemical (dry) corrosion of metals. [10]

(b) Explain anodic sacrificial protection to minimize corrosion. [6]

Roll No. _____

2E2001

Total No of Pages: 3

2E2001

B. Tech. II Sem. (Main / Back) Exam., May - 2017
Common to all Branch
201 Communication Techniques

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks Main: 26
Min. Passing Marks Back: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

UNIT – I

Q.1 Describe the meaning and importance of communication.   [16]

OR

Q.1 What are the objectives of communication?   [16]

UNIT – II

Q.2 Describe merits and demerits of verbal communication.   [16]

OR

Q.2 What are the advantages and limitations of formal communication?   [16]

UNIT – III

Q.3 How is professional communication useful for organizations?   [16]

OR

Q.3 What is interpersonal communication? Discuss the various methods to improve interpersonal communication.   [16]

UNIT – IV

Q.4 Combine the following sentences:

   (a)   A girl has been recovered.   [4]

       She was kidnapped last Sunday.

   (b)   A bomb killed many people.   [4]

       It was planted by anti-national elements.

   (c)   Some cash has been stolen.   [4]

       It was stolen from a bank.

   (d)   The plane was not in good condition.   [4]

       It crashed.

OR

Q.4 Fill in the appropriate conjunctions:

    (a)   He works hard _____ he may get a first division.   [4]

          (because, in order that, although)

    (b)   No sooner did the lion saw the deer _____ it pounced on it.   [4]

          (when, than, unless)

    (c)   Animals don't kill _____ they are hungry.   [4]

          (unless, because, though)

    (d)   _____ he is rich, he wants to get more money.   [4]
          (because, though, when)

UNIT – V

Q.5 You are a B. Tech. A faculty position in your branch is vacant in a college. Apply for this position with resume. Invent necessary details.   [16]

OR

Q.5 What things should be kept in mind while making and receiving phone calls?   [16]

2E2002

B. Tech. II Sem. (Main / Back) Exam., May - 2017
202 Engineering Mathematics - II

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks Main: 26
Min. Passing Marks Back: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. <u>NIL</u>   2. <u>NIL</u>

UNIT – I

Q.1 (a) A sphere of constant radius r passes through the origin O and cuts the axes in A, B and C. Find the locus of the foot of the perpendicular for O to the plane ABC.

[8]

(b) Find the equation of a right circular cone with vertex (2, 3, 1), axis parallel to the line $\frac{x}{-1} = \frac{y}{2} = \frac{z}{1}$ and one of its generators have the direction ratios 1, -1, 1.   [8]

OR

Q.1 (a) Prove that the center of sphere which touch the line $y = mx$, $z = c$ and $y = - mx$, $z = - c$ lies on the conicoid $mxy + c (1 + m^2)z = 0$.

[8]

(b) Find the equation of the right circular cylinder whose guiding curve is the circle $x^2 + y^2 + z^2 = 9$, $x - 2y + 2z = 3$.

[8]

UNIT – II

Q.2 (a) Determine the value of k such that the rank of matrix A is 3, where

$$A = \begin{bmatrix} 1 & 1 & -1 & 0 \\ 4 & 4 & -3 & 1 \\ k & 2 & 2 & 2 \\ 9 & 9 & k & 3 \end{bmatrix}$$

(b) Diagonalize the matrix -

$$A = \begin{bmatrix} 5 & -2 & 0 \\ -2 & 6 & -2 \\ 0 & -2 & 7 \end{bmatrix}$$

[8]

OR

[8]

Q.2 (a) Find eigen values and eigen vectors of the matrix -

$$A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$$

[8]

(b) Solve the following system of linear equations:

$x + 2y - z = 3,$

$3x - y + 2z = 1,$

$2x - 2y + 3z = 2,$ and

$x - y + z = -1$

UNIT – III

Q.3 (a) Suppose $\phi(x, y, z) = xy^2z,$ and $A = xzi - xy^2j + yz^2k,$

[4]

Find $\dfrac{\partial^3}{\partial x\, \partial y\, \partial z}(\phi A)$ at the point (2, -1, 1).

(b) Suppose $F = -3x^2i + 5xyj,$ Evaluate $\int_C F.\, dr$

[4]

where C is the curve in the xy – plane, $y = 2x^2,$ from (0, 0) to (1, 2).

(c) Evaluate $\iint_S$ A. n ds, where A = 18zi – 12j + 3yk, and S is that part of the plane 2x + 3y + 6z = 12, which is located in the first octant. [8]

OR

Q.3 (a) If r = xi + yj + zk, then prove that 1/r is a solution of Laplace's equation. [4]

(b) Show that grad (r^n) = nr^{n-2} **r**, where **r** = xi + yj + zk. [4]

(c) Let F = 4xzi – y^2j + yzk. Evaluate $\iint_S$ F.**n** ds where S is the surface of the cube bounded by x = 0, x = 1, y = 0, y = 1, z = 0, z = 1. [8]

UNIT – IV

Q.4 (a) Verify Stokes' theorem for F = yi + zj + xk, where S is the upper half surface of the sphere $x^2 + y^2 + z^2 = 1$ and C is its boundary. [8]

(b) Express $f(x) = \begin{cases} -\pi, & -\pi \le x < 0 \\ x, & 0 \le x \le \pi \end{cases}$ as a Fourier series and hence find the sum of

the series $\dfrac{1}{1^2} + \dfrac{1}{3^2} + \dfrac{1}{5^2} + \ldots\ldots$ [8]

OR

Q.4 (a) If **F** = xi – yj + (z^2-1) k, using Gauss's divergent theorem find the value of $\iint_S$

F. n ds where S is the closed surface bounded by the planes z = 0, z = 1 and the cylinder $x^2 + y^2 = 4$. [8]

(b) Analyze harmonically the data given below and express y = f (x) in Fourier series up to the third harmonic. [8]

x	0	1	2	3	4	5
f (x)	4	8	15	7	6	2

UNIT – V

Q.5 (a) Solve in series the differential equation : [8]

$$2x^2 \frac{d^2y}{dx^2} - x\frac{dy}{dx} + (1-x^2)\, y = 0$$

(b) Solve: [8]

(i) $2xzp + 2yzq = z^2 - x^2 - y^2$

(ii) $z\,(xp - qy) = y^2 - x^2$

OR

Q.5 (a) Using Charpit method, obtain complete integral of the equation $(p^2 + q^2)\, y = qz$.

Also find its singular and general integrals. [8]

(b) Solve: [8]

(i) $(x + 2z)\, p + (4xz - y)\, q = 2x^2 + y$

(ii) $x^2 p^2 + y^2 q^2 = z^2$

2E2003

2E2003
B. Tech. II Sem. (Main / Back) Exam., May - 2017
203 Engineering Physics - II

Time: 3 Hours   **Maximum Marks: 80**
                                        Min. Passing Marks Main: 26
                                        Min. Passing Marks Back: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

UNIT – I

Q.1 (a) What is Compton Scattering? Obtain an expression for shift in wavelength of scattered photon by Compton Scattering.   [8]

(b) Explain the physical significance of wave function and hence derive One Dimensional time dependent Schrodinger's wave equation.   [8]

OR

Q.1 (a) Write down Schrodinger's equation for a particle enclosed in One Dimensional box of infinite height. Solve it for eigen values and eigen functions.   [8]

(b) Calculate maximum percentage change in the wavelength due to Compton Scattering for incident photons of wave length 1A°, 10A°, 100A°. What inference do go draw from this calculation? [8]

UNIT – II

Q.2 (a) What are the postulates of Somerfield's Gas Model? Obtain the expression for density of Energy States for free electron as in a metal, also find the formula for Fermi energy at absolute zero temperature. [8]

(b) Write a short note on 'α – decay'. [8]

OR

Q.2 Explain in Detail – 'Tunnel effect', and prove that R + T = 1. [16]

UNIT – III

Q.3 (a) What do you mean by spatial and Temporal coherence for propagating waves? [6]

(b) Explain the Term Coherence Length and Coherence Time. [6]

(c) Show that visibility is a measure of degree of Coherence. [4]

OR

Q.3 (a) What is an Optical Fiber? What do you mean by Numerical aperture of an optical fiber? Find an expression for the numerical aperture of a Step Index Optical fiber. [8]

(b) What are the applications of Optical fibers? [4]

(c) An optical fiber has refractive index of core to be 1.5 and the relative refractive index difference of core cladding to be 0.01. Determine numerical aperture and maximum angle of acceptance. [4]

UNIT – IV

Q.4 (a) What is the principle of laser action? Explain in detail. [8]

(b) In He – Ne laser, What is function of He – atoms? Explain the answer with the help of Energy level diagram for He – Ne. Describe with neat sketch the working of He – Ne laser. [8]

OR

Q.4 (a) Discuss construction and reproduction of image of a hologram. In brief, discuss applications of a hologram. [8]

(b) What is holographic microscopy? How it is superior to ordinary microscopy? With illustrative diagram show outlay of a holographic microscope and explain its working. [8]

UNIT – V

Q.5 (a) Draw a labeled diagram of G M counter. Draw its voltage characteristics. Explain and indicate the following over it - [10]

(i) Threshold Voltage

(ii) Plateau Region

(iii) Working Voltage and

(iv) Continuous Discharge Region

(b) Explain the meaning of Avalanche. How can this effect be used to detect a single particle? [6]

OR

Q.5 Write a short note on the following (any two) - [8+8=16]

(a) Ionization Chamber

(b) Halogen quenchers

(c) Proportional Counters

2E2004

B. Tech. II Sem. (Main / Back) Exam., May - 2017
204 Chemistry & Environmental Engineering

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks Main: 26
Min. Passing Marks Back: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

UNIT – I

Q.1 What are the requisites of potable water? Explain various steps involved in municipal water supply.

[4+12=16]

OR

Q.1 (a) Explain determination of hardness by Clark's method. [8]

(b) 50 ml of water sample on titration with soap solution gave following results –

(i) Lather factor = 0.4 ml

(ii) Total hardness volume = 8.2 ml

(iii) Permanent hardness volume = 2.5 ml

(iv) Standard hard water containing 0.2gm of $CaCo_3$ per liter = 19.9 ml

Calculate temporary, permanent and total hardness in ppm. [8]

UNIT – II

Q.2 Explain De-ionization method of water softening with suitable diagram. [16]

OR

Q.2 Write short notes on the following:

    (a)   Caustic embrittlement [4]

    (b)   Formation of scales and its prevention in boilers [4]

    (c)   Priming in boilers [4]

    (d)   Corrosion in boilers [4]

UNIT – III

Q.3 (a) What is bio–diversity? Describe the ecological importance of bio –diversity. [10]

    (b)   Describe renewable sources of energy. [6]

OR

Q.3 What is Environmental Impact Assessment (EIA)? Discuss the detailed methodology of implementing EIA. [16]

UNIT – IV

Q.4 What is solid waste management? Describe various steps involved in disposal of solid waste. [16]

OR

Q.4 Write short notes on any four of the following: [4×4=16]

    (a) Sanitary landfill

    (b) Acid rain and its effect

    (c) Consequences of global warming

    (d) Noise pollution and its control

    (e) Importance of prevention of ozone depletion

    (f) Control of air pollution

UNIT – V

Q.5 (a) What is corrosion? Explain the mechanism of dry corrosion.   [8]

    (b) Discuss waste water management in the disposal of waste water.   [8]

OR

Q.5 Explain any two of the following: [8+8=16]

    (a) Prevention and control of corrosion

    (b) Water pollution, its harmful effects and control

    (c) Pilling Bedworth's Rule

2E2005

B. Tech. II Sem. (Main / Back) Exam., May - 2017
Common to all Branch
205 Engineering Mechanics

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks Main: 26
Min. Passing Marks Back: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

UNIT – I

Q.1 (a) State and explain the Varignon's theorem.   [8]

(b) A hemisphere of radius *r* and weight W is placed with its curved surface on a smooth table and a string of length l (< r) is attached to a point on its rim and to a point on the table as shown in Figure. Find the tension of the string.   [8]
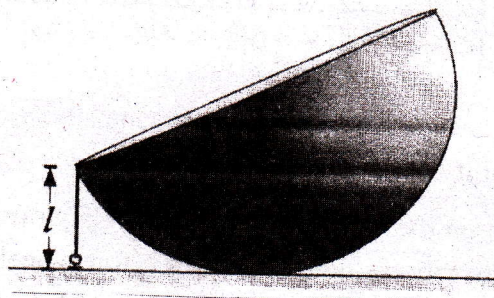
Q.1 (a) Explain the principal of virtual work? [8]

(b) What is the maximum load W that a force will hold up, if the coefficient of friction between lever and pulley is 0.2 in the arrangement shown in Figure? Neglect the weight of lever. [8]
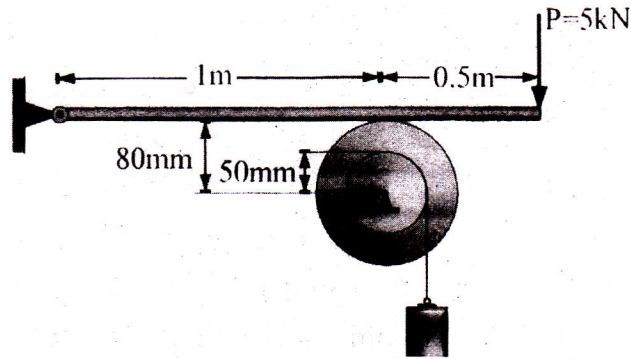
UNIT – II

Q.2 (a) Determine the moment of inertia of a thin elliptical disk of mass m, having axial radius of a and b. [8]

(b) Determine the centroid of the composite figure about x-y coordinate. Take x = 40 mm. [8]
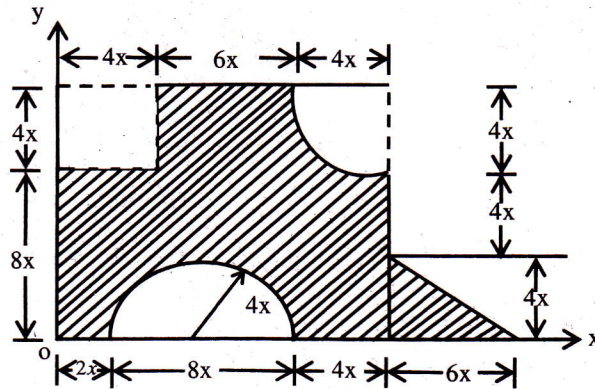
OR

Q.2 (a) Explain the reversibility and law of machine. [8]

(b) The number of teeth on the worm wheel of a single worm and worm wheel is 60. Calculate the velocity ratio if the diameter of effort wheel is 25 cm and that of load drum is 12.5 cm. The effort required to lift a load of 600 N by this machine is 20 N. Find the efficiency of the machine. [8]

UNIT – III

Q.3 (a) Define the angle of friction and angle of repose. [8]

(b) Find the minimum value of the coefficient of friction between a body and a plane, so that the body may roll without slipping. The radius of gyration and radius of body are k and r, respectively [Fig.] [8]


OR
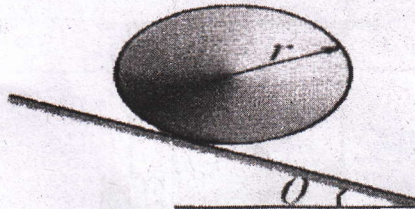
Q.3 (a) Derive can expression for the limiting ratio of tension in a V-belt over pulley. [8]

(b) Sand drops continuously from a hooper on to a moving belt as show in Figure. What force and power are required to keep the belt moving at a constant speed? [8]
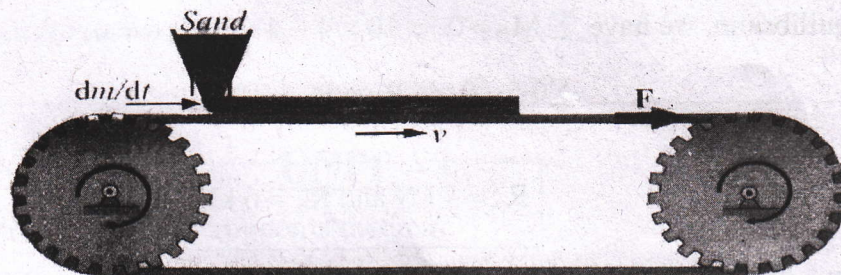

UNIT – IV

Q.4 (a) Find Range, time of flight and maximum height for a projectile motion. [8]

(b) A sphere is fired horizontally into a viscous liquid with an initial velocity of 27 m/s [Fig.] If it experiences a deceleration $a = -6t$ m/s$_2$, where t is in seconds, determine the distance traveled before it stops. [8]

OR
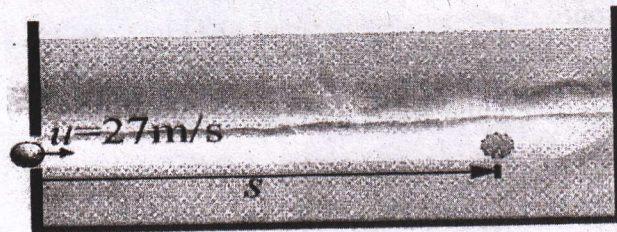
Q.4 (a) Define and explain Newton's law of motion for rotational motion. [8]

(b) If the system shown in figure is released from rest, find

(i) velocity v of the falling block A as a function of y, and [4]

(ii) tensions of the string. [4]
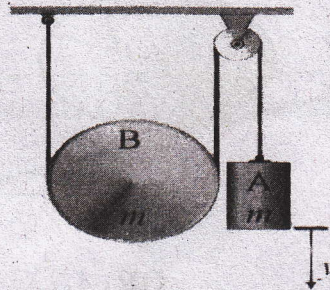
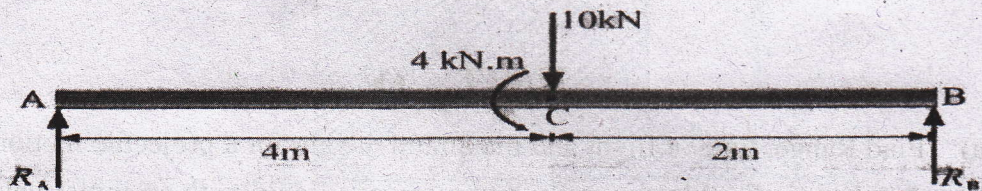# UNIT – V

Q.5 (a) Explain the principal of work and energy. [8]

(b) By transferring a load 10 kN at C by a force 10 kN and a moment 4 kNm, we draw free body diagram of the beam [Fig.] and applying equations of equilibrium, we have $\sum M_A = 0 \Rightarrow 10 \times 4 - 4 - R_B \times 6 = 0$ [8]

$$\sum F_y = 0 \Rightarrow R_A + R_B - 10 = 0$$

$$\boxed{R_A = 4 \text{ kN and } R_B = 6 \text{ kN}}$$

OR

Q.5 Write short note on:

(a) Conservation of Energy [8]

(b) Conservation of angular momentum [8]