Sub- Engineering Chemistry

1.   Answer any four questions.   **[4X5]**

a)   Write the Postulates of Ruther ford's atomic model.

b)   Write the limitations of Bohi's atomic model.

c)   State the Bohr-Burry principle.

d)   Define covalent bond and Ionic bond ? Give examples.

e)   Describe Arrhenius Theory of acids and bases.

Sub- Computer Application

1.   Answer all the questions.   [5X4]

a)   Describe the evalution of computer system.

b)   Write the algorithm along the flow chart of computation of factorial of a number.

c)   Write the algorithm along the flow chart of calculating the area of a triangle.

d)   Explain different categories of memory system.

Sub- Basic Electronic Engg.

1. **Answer all the questions.** **[10X2]**

a) Explain insulator, conductor and semi conductor on the basis of band theory.

b) Explain the forward and reverse bias of PN junction diode and draw the characterstic graph.

Sub- Communicative English

1. Define communication ? Discuss the various factors responsible for process of communication. **[10]**

2. **Answer the following questions. (Any Five)** **[5X4]**

a) Define 'Feedback' ?

b) Give one example of 'Auditory channel' in the process of communication.

c) What do you mean by 'ideation' ?

d) Define 'Barriers to communication' ?

e) Analyse the word 'Audience' in the process of communication.

f) What do you mean by 'Horizontal communication' in an organization ?

Sub- Engineering Physics

1. **Answer all the questions.** [1x5]

a) Write down the relation between angle of friction and co-efficient of friction.

b) Sliding friction < Rolling friction. (True / False)

c) Give one example of a lubricant.

d) Dimensional formula for force is _____.

e) Write down the dimensional equation for area.

2. **Answer any four questions.** [2x4]

a) Write three properties of cross product of vectors.

b) Define equation of trajectory for a projectile.

c) Differentiate between static and dynamic friction.

d) A force of 1000N is applied to a 1200Kg car. If the co-efficient of rolling friction

is 0.04, what is the car's acceleration ?

e) Find out the angle between two vectors $\vec{A}$ & $\vec{B}$, if their dot product & cross

product are equal.

3. **Answer any one question.** [7]

Derive the expression for the variation of 'g' with altitude.

Or

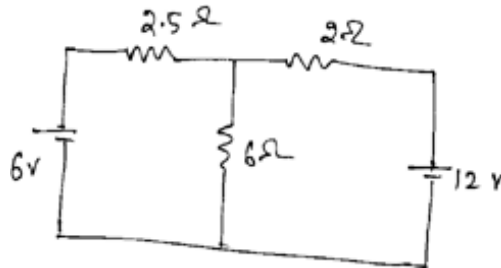Derive the expression for the variation of 'g' with depth.

Sub- Basic Electrical
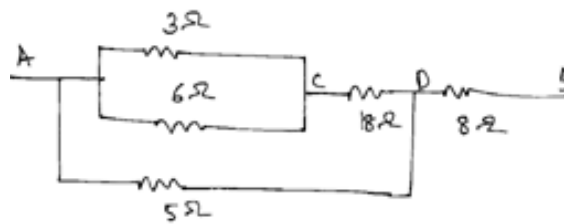
2. **Answer any two questions.** [10X2]

a) Using thevenin's theorem, calculate the current through ____ resistor of the circuit given below.
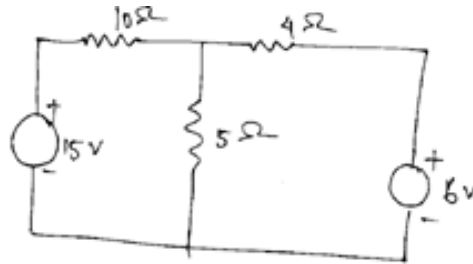
b) The buttery emf 6V & 12V having internal resistance ____ & 1Ω respectively. Find the different current following in the branches and voltage across ____ resistor.

c) Calculate the effective resistance of the following combination of resistance and voltage drop across each resistance when potential difference of 60V applied between points A & B.

Sub- Engineering Math-II

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1. **Answer any two questions.** **[5x2]**

a) Evaluate $\dfrac{\tan x - \sin x}{x^3}$

b) Evaluate

c) Evaluate $\sqrt{x}\left(\sqrt{x+1} - \sqrt{x}\right)$

2. **Answer any one questions.** **[10]**

a) Examine the continuity of the function

$$f(x) = \begin{array}{l} 2x+1 \ \ if \ x \le 0 \\ x \\ 2x-1 \ \ if \ \ x \ge 1 \end{array}$$

of $x = 0$

b) Examine the continuity of the function

$$f(x) = \begin{array}{l} \dfrac{|x|}{x}, \ \ x \ne 0 \\ 0, \ x = 0 \end{array}$$

of $x = 0$

$$\dfrac{if \ (x+9)^3 \le 1 \ 27}{x}$$

Sub- Engg. Mechanics

ANSWER ANY FIVE FROM QUESTION NO. 1 AND ANY TWO FROM QUESTION NO. 2.

1.a) Define engineering mechanics and classify it. [2x5]

b) Define 'force' and write its unit in gravitational system.

c) Differentiate between kinematics and kinetics.

d) Define one joule of work. What is the work done by a coolie carrying a luggage of 50kg over his head and walking along the platform ?

e) Find the potential energy of mass 2kg raised through a height of 1m from the ground.

2.a) A constant retarding force of 100N is applied on a body of mass 50kg at rest. Find the distance travelled by it in 12 sec. [5]

b) A trolley of mass 200kg moves on a level track for a distance of 500m. If the resistance of truck is 100N, find the W.D. is moving the trolley. [5]

c) A bullet of mass 10g is fired horizontally with a velocity of 1000m/s from a gun of mass 50kg. Calculate the force necessary to bring the gun to rest is 250mm. [5]

Sub- Computer Application

Answer any four. [4x4=16]
1. Discuss about the generation of computer ? Explain the key factors of computer of each generation ?
2. What is memory hierarchy ? explain the main features of the various types of memory present in different levels of this hierarchy ?
3. Difference between system software & application software ?
4. What are the various types of operating system used on PC ?
5. What do you mean by ''DTM'' (Data transmission mode).

Answer any two. [2x2=4]
1. Difference between windows & DOS ?
2. What is a programming language and types of programming language ?
3. Define computer network & what are the various types of networks ?

Long question.   **[5X2]**
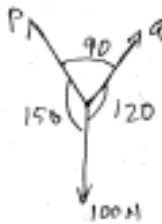
1.   Short questions.   [2x5]
a)   What do you mean by friction, classify it ?
b)   What do you mean by co-efficient of friction ?
c)   What is limiting friction. Explain with suitable diagram.
d)   What is lami's theorem ?
e)   Calculate the magnitude of P & Q.

2.   A uniform ladder 3m long weighs 200N. It is placed against a wall making an angle of 30^0 with the floor as shown in figure. The co-efficient of friction between the wall and the ladder is 0.25 and that between the floor and ladder 0.35. The ladder, in addition to its own weight, has to support a man of 1000N at its top at B. calculate the horizental force 'P' to be applied to ladder at the floor level to prevent slipping.
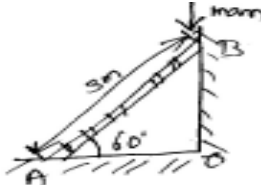
3.   Find the reactions between ball & surface, if the weight of the ball is 100N.
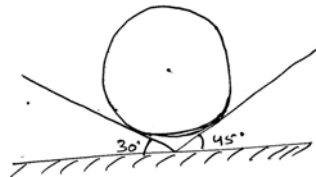
1. **Answer any two.** [5x2=10]

a) Evaluate $\lim\limits_{x \to 4} \dfrac{x^2 - 16}{x - 4}$

b) Evaluate $\lim\limits_{x \to 0} \dfrac{\tan x - \sin x}{x^3}$

c) Differentiate $\qquad$ w.r.t. x

d) Find the derivative of $\sin^{-1} \dfrac{2x}{1 + x^2}$ w.r.t.

2. Answer any one. [10x1=10]

a) If $\qquad$ find $\dfrac{dy}{dx}$

b) Examine the continuity of the function.

$$f(x) = \begin{cases} x - 1, & x < 2 \\ 2x - 3, & x \ge 2 \end{cases} \quad \text{at} \quad x = 2$$

$y = \tan^{21}\left(\dfrac{x-1}{x+1}\right)(\sec x + \tan x)$

Group-A (Any One) [7x1]

1. Describe about Rutherford experiment.

2. Explain acid base theory ?

Group-B (Any One) [5x1]

1. What is chemical bonding ? Describe about Ionic bond with example ?

2. Describe faraday's law of electrolysis ?

Group-C (Compulsory) [1x8]

1. Write down the electronic configuration of cupper ?

2. What is variable valency ?

3. Calculate the equivalent mass of H_2SO_4 ?

4. What is Buffer solution ?

5. Define Normality ?

6. Write down the formula of di-sodium Hydrogen Phosphate ?

7. What is PH of solution ?

8. What is secondary cell ?

Sub- Communicative English

Answer all the questions ?

1.   Write down about the stages in communication ?   [5]

2.   Write a note on communication situation ?   [5]

3.   What is informal communication ? Explain its merits ?   [5]

4.   Explain the difference between upward and downward

        communication ?   [5]

Sub- Basic Electronics

1. **Answer all the questions.** [2x5]
(a) What is electron emission and named different types of electron emission ?
(b) Draw energy band diagram of semiconductor.
(c) What is zoner diode ? Draw its symbol.
(d) What is TUF ?
(e) Write difference between P-type and N-type semiconductor.
2. **Answer any two questions.**
    [5x2]
(a) What is rectifier ? Explain full wave bridge rectifier with proper circuit diagram.
(b) Find relation between $\alpha, \beta, \& \gamma$ for a transistor.
(c) What is transistor biasing. Explain base resistor method for transistor biasing.

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1.   **Answer all the questions.**   **[2x10]**

(a)   Write the dimensional formula of 'G'.

(b)   Check the correctness of relation $t = 2\pi\sqrt{g/l}$

(c)   Find the other rectangular component of velocity 65 m/s if one of it component is 25 m/s.

(d)   What is the range of projectile fired vertically upwards under gravity ?

(e)   Give an example of perfectly smooth surface. What is the value of 'μ' in this surface.

(f)   Define coefficient of friction and limiting fraction.

(g)   What is the relation between 'g' and 'G' ? Write their units is S.I. system.

(h)   Write the relation between frequency wave length and velocity of wave.

(i)   If $\vec{A} = 5\hat{\imath} + 2\hat{\jmath}, \vec{B} = 3\hat{\imath} + 7\hat{\jmath}$ find $\vec{A}.\vec{B}.$ Is it a vector or scalar ?

(j)   Define longitudinal and trans versa wave.

Sub- Basic Electrical Engg.

QUS 1 ANSWER ALL THE QUESTIONS   (2X5)
    A. Define Ohm's Law?
    B. What is the function of commutator in DC generator?
    C. Calculate the Equivalent Resistance when two, $2\,\Omega$ resisters are connected in parallel with three, 3 resisters in parallel and both parallel connections are connected in series.
    D. What are the types of DC Motor?
    E. Write the both EMF expression of DC shunt generator?

QUS 1 ANSWER ANY TWO   (5X2)
    A. A shunt generator delivers 450 A at 230V and the resistance of the shunt field and armature are 50 and 0.03 respectively. Calculate the Armature current and generated EMF.
    B. Explain with Diagram different parts of DC Machines?
    C. A house contains 4 tube lights of 40W running for 7 hours, 3 Fans of 80W running for 8 hours and 1HP pump running for 3 hours. Calculate the electricity bill for the month of March when per unit charges Rs. 3.20.

Sub-Math

1. Answer any two questions. [10x2]
a) Prove without expanding that

$$\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = abc\left(1+\frac{1}{a}+\frac{1}{b}+\frac{1}{c}\right)$$

b) Solve the given equations by matrix method
x-y+z=4, 2x+y-3z=0, x+y+z=2

c) Resolve into partial fractions

$$\frac{x^2}{(x+1)^2(x-2)}$$

d) Find the square roots of -15-8i

Sub-Engg. Chemistry

Answer any four questions.   **[5x4]**

1.   Define a) Calcinations   b) Roasting c) Smelting

2.   Explain the factors that influence the rate of corrosion.

3.   What are alloys ? Write the composition and uses of brass and
      Duralumin.

4.   Define the process of electroplating.

5.   What is homologous series ? Write the characteristic of a homologous
      series.

Sub-Basic Electrical Engg.

1. Answer all questions. (any five)   [2x5]

a) What are the necessity of earthing ?

b) Write the types of wiring & definition of wiring.

c) State the advantages of nuclear power station.

d) Write definition of measuring, instruments.

e) What are the types of instrument ?

2. Answer all questions. (any five)   [5x2]

a) Discuss briefly about wind energy.

b) Discuss about nuclear power station briefly.

c) A building has following electrical applications i) 1 HP motor running for 5 hrs in a day ii) 3 fans each of 80w running for 10 hrs in a day iii) 4 tube lights of 40w running for 15 hrs per day. Find monthly bill for month of November if unit cost of bill is Rs. 2.50.

Sub-Physics

1.   Answer all the questions.   [1x5]
a)   Value of Joule's Mechanical equivalent of heat = _____
        Joule/Cal.
b)   What is the horizontal range of a projectile fired vertically
        upward ?
c)   Write down the relation between β & γ.
d)   What is the shape of the trajectory of a projectile ?
e)   Write down the relation between force of friction & normal reaction.
2.   Answer all the questions.   [2x4]
a)   What do you mean by force of limiting friction ?
b)   Define total internal reflection, write one application of total internal
        reflection.
c)   The refractive index of glass & water are 1.5 & 1.3 respectively,
        What is the critical angle when the ray passes from glass to water ?
d)   Define co-efficient of cubical expansion.
3.   Derive Mayer's formula (Relation between C_P & C_V) for 1 mole of
        an ideal gas.   [7]

                                Or

        Derive expression for equation of trajectory, time of descent,
        horizontal range of a projectile fired horizontally.

Sub- Comm. English

1.   Answer any five questions.   [5x2]
a)   Who is Khairi ?
b)   Who is the foster father of Khairi ?
c)   What experience did the author have in the Tiger Reserve area ?
d)   What kind of family and Mr. Choudhiry have ?
e)   What is the personality of Soraj Raj Chaudhury ?
f)   Explain-'She was not Pretty but was beatiful'.
2.   Do as directed.   [5x2]
a)   Identify the tense.
        They have been living in this town for the last 20 years.
b)   _____earth moves round the sun. (Supply the correct article)
c)   _____of us went to see the famous actor. (Much/Many)
d)   Geeta lived in Delhi since 1990. (Correct the sentence)
e)   You _____speak the truth. (Supply correct modal verb)

Sub-Basic Electronics Engg.

1.   Answer any one questions.   [1x10]
a)   Drive the relations between α, β, γ where symbols have their usual meaning.
b)   Explain the block diagram of CRO, how the measure frequency and amplitude using CRO.
2.   Answer all the questions.   [5x2]
a)   Explain the full wave rectifier centre tapped method with neat circuit diagram.
b)   How Zenor diode act as a voltage regulator explain ?

Sub-Computer Application

1. Answer any four questions. [5x4]

a) What is memory hierarchy ? Explain the main features of the various types memory present at different level of the hierarchy.

b) Explain the working of a digital computer with a functional block diagram.

c) Define operating system. Discuss about measure function & type of operating system.

d) Discuss about types of software.

e) Different between the complier and interpreter.

Sub-Engg. Mechanics

1.   Answer all the questions.   [10x2]

a)   Determine the C.G. of following L-section.

b)   Determine the reactions of point A & B.
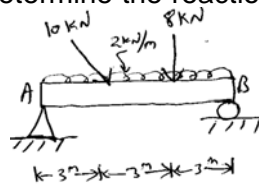
Sub- Engg. Chemistry

Answer all the questions.

1. Describe the neutralisation of acids and bases. {5}

2. What is co-ordinate bond ? Give three examples of coordinate bonding ?{5}

3.a) How can you prepare 4 litres of 5 N H_2SO_4 ? {2.5x4}

b) Calcuate the amount of Na_2CO_3 present in 3 liters of 0.01N Na_2CO_3 solution.

c) Calculate the amount of Nacl present in 7 liters of 5M Nacl solution.

d) Find the normality of K_2SO_4 solution if 0.87gm of K_2SO_4 is dissolved in 500ml of solution.

Sub- Computer Application

Answer any five questions.   {4x5}

1.   Difference between Window & DOS.
2.   Difference between Unix & DOS.
3.   What is Operating Sytem & types of Operating System in a computer ?
4.   What is virus in a computer and how to prevent and detection a virus in a computer ?
5.   What is C language & basic structure of 'C' program ?
6.   Difference between Algorithm and Flowchart.

Sub- Engg. Physics

Answer all the questions.

1.   Find out the dot product and cross product of two vectors in terms of rectangular components.   {5}

2.   Derive the equation of motions in one dimension.   {10}

3.   Find out the equation of trajectory. Time of descent and horizontal range for a projectile fired horizontally.   {5}

Sub- Math-I

Answer any one questions. {10x1}

1. If $\cos^{-1} x + \cos^{-1} y + \cos^{-1} z = \pi$ then prove that $x^2 + y^2 + z^2 + xyz^2 = 1$.

2. If $\tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \dfrac{\pi}{2}$

   a) Show that $xy + yz + zx = 1$

   b) Find the values of $\tan^{-1}\left(\dfrac{x}{y}\right) - \tan^{-1}\left(\dfrac{x-y}{x+y}\right)$

Answer any two questions. {5x2}

3. Show that the points

   A (-1, 4), B (0,2) and c (2,-2) are collinear.

4. Find the equation of straight lines passing through (-2, 3) and sum of whose intercept is 2.

5. Find the equation of line bisecting the line sement joining (3, -4) and (1,2) at right angles.

Answer all the questions.

1. Find the centre of gravity of the T-section 120mmx200mmx50mm.

   {5}

2. State and prove parallel axis theorm.   {5}

3. Find M.I. about centroidal axis parallel to y-axis as shown in figure.
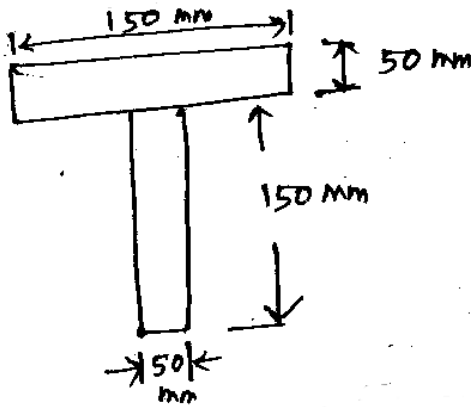
lifting machine efforts of 10N and 16N lifed loads of 50N and 80N

ectively. If V.R. is 6, find

w of machine   {2}

aximum   {1}

fort loss due to friction at 50N.   {2}

Sub- Basic Electronics

Answer all the questions.

1. What is a transducer ? Give examples.   {2}

2. Define α ,   and   ?   {2}

3. Mention two differences between FET and JFET ?   {2}

4. Draw i/p and o/p characteristic of CE configuration.   {2}

5. Give two advantages of modulation.   {5}

6. Describe working of pnp transistor with suitable diagram. {5}

7. Describe amplitude modulation and frequency modulation.   {5}

Sub- Engg. Mechanics

1.   Answer all the questions.   {2x5}

a)   State Lami's Theorum.

b)   Write down the conditions of equilibrium.

c)   State Varigron's principle of moments.

d)   Define ideal machine. Write down the equation of law of lifting machine.

e)   What are the types of lifting machines ? Name them.

2.   Answer all the questions.   {5x2}

a)   An electric light fixture weighting 15N hangs from a point C, by two strings AC and BC. The string AC is inclined at 60^0 to the horizontal and BC at 45^0 to the horizontal as shown in figure.
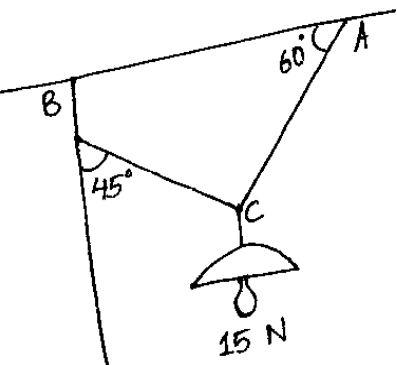
Use Lami's theorum, or otherwise, determine the forces in the strings AC and BC.

b)   A certain weight lifting machine of velocity ratio 10 can lift a load of 840N. with the help of 100 N effort. Determine if the machine is reversible. Calculate friction both on effort and load side.

Sub- Communicative English

1.   Write down the paragraph from the following. (Any one)   {15}

i)   The importance of English in present era.

ii)   Sachin Tendulkar- The God of Cricket.

iii)   Newspaper Reading habit.

iv)   India in 2020.

v)   The status of woman in Indian society.

vi)   Computer.

2.   Prepare a brief summary of 'Daffodils'.   {5}

    (A peom by William Wordsworth)

Sub- Basic Electrical Engineering

QUS 1 ANSWER ALL THE QUESTIONS (2X5)

A. Define dc generator ?

B. What is the function of commutator in DC generator?

C. Calculate the Equivalent Resistance when two, 2 Ω resisters are connected in parallel with three, 3 resisters in parallel and both parallel connections are connected in series.

D. What are the types of DC Motor?

E. Write the both EMF expression of DC shunt generator?

QUS 2 ANSWER TWO (5X2)

A. A shunt generator delivers 450 A at 230V and the resistance of the shunt field and armature are 50 and 0.03 respectively. Calculate the Armature current and generated EMF.

B. Explain with Diagram different parts of DC Machines?

Ω

Sub- Computer Application

1. Answer all question. [4x4]
a) What is VIRUS ?
b) What is Network Topology ?
c) What is internet & their service ?
d) Difference between Algorithm and Flowchart.
2. Answer any two. [2x2]
a) Difference between File & Folder.
b) What is Array ?
c) What is Recursion ?

1.   Answer all questions.   [2x5]
a)   Define two specific heat of gas.
b)   Define mechanical equivalent of heat.
c)   What is doppler's effect ?
d)   Wht is co-efficient of thermal conductivity ? Write its unit & dimension.
e)   What is snell's law ?
2.   Derive the relation between $\alpha \; and \; \gamma$.   [5]
3.   A piece of cu-wire has a length of 100cm at 0^0C. find its length in S.I. unit at 100^0C if $\gamma = 51x10^{-6}/0_C$.   [5]

Answer all the questions.
1. Write a note on features of communication ? [5]
2. What is Barriers to communication ? Explain language & semantic barriers ? [5]
3. Write a note on effective communication ? [5]
4. Write a detailed note on psychological barriers ? [5]

Answer any two.   [10x2]

1.   What is chemical bonding ? Describe about Ionic bond with
      example?
2.   Explain acid base theory ?
3.   Write down the composition of bronze, brass, duralumin, alnico.

Sub- Basic Electronics Engg.

Q.1 Answer all the question **(2X5=10)**

a) Define regulated dc power supply? Draw its block diagram?

b) Write the function of C_{in}, C_e, C_c ?

c) Define oscillator? Write its type?

d) Define active and passive transducer and give its example?

e) Define modulation and demodulation? What are the types of modulation?

Q.2 Answer any two **(5X2=10)**

a) Draw the block diagram of CRO and explain its operation?

b) Explain the process of AM and FM? Write the difference between AM and FM?

C) Explain how zener diode can be used as a voltage regulator? Draw the wave form at different stages?

Sub- BASIC ELECTRICAL ENGINEERING

ANSWER ALL THE QUESTIONS   (2X10)

    a) What is renewable energy?

    b) Define generation of electrical energy?

    c) Write 2 advantages of hydroelectric power plant?

    d) Write 2 disadvantages of thermal power plant?

    e) Define measuring instruments?

    f) What are the traditional methods of generating electricity?

    g) Write down 4 parts name of hydro power plant?

    h) Define nuclear power plant?

    i) What is deflecting torque?

    j) What is the advantage of solar power?

1.   Answer any one.   [10x1]

a)   If $y = (Sin\ x)^{Cos\ x} + (Cos\ x)^{Sin\ x}$ then find $\frac{dy}{dx}$

b)   If $y = e^{m cos^{-1} x}$ then show that

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

2.   Answer any one.   [10x1]

a)   Show that the centroid of the triangle with vertices

A (x_1, y_1, z_1), B (x_2, y_2, z_2) & C (x_3, y_3, z_3) is

$$\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}, \frac{z_1 + z_2 + z_3}{3}\right)$$

b)   Find the ratio in which the line through (2,4,5), (3,5,-4) is divided by xy - plane.

1. ***Answer all question.***

1.   Write a programme to find out the factorial of a number using for loop.   [10]

2.   Write a programme to compute the sum, different and product of 2 numbers using function ?   [10]

Sub- Computer Application

(The figures at right hand side indicate marks)

Answer All Questions.

1. a) List out different input and output devices of a computer system.[2X5]

b) What are different units of a computer system?

c) Differentiate between System software and Application software.

d) Compare Multi-tasking vs. Single-tasking Operating System.

e) What are RAM and ROM?

2. a) Describe different generations of computer system evolution.
    [5X2].

b)   What is Operating System? Explain different types of Operating System.

** ** **

Sub- Engg. Mechanics

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1. Define equilibrium in system of forces.

    [2]

2. What is con-current, co-planner, co-linear forces. [2]

3. State Lami's theorem. [2]

4. What is free body diagram ? [2]

5. State parallelogram law of forces. Derive expressions for magnitude & directions of the resultant. [5]

6. Find out the tensions T_1, T_2, T_3 in the given figure also find out W1 & W2. [7]
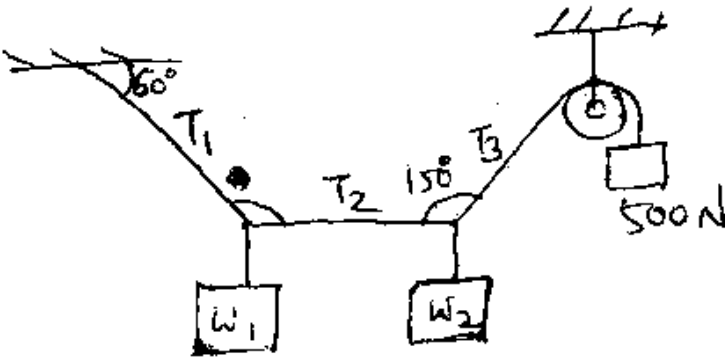
Sub- Communicative English

Set-A

1. Define ''Communication'' ? Discuss the factors responsible for communication process ? [10]

Set-B

Answer all questions. [5x2=10]

1. What do you mean by ''Ideation'' ?
2. Define 'Channel' in the process of communication ?
3. Give one example of auditory channel ?
4. What do you mean by upward communication ?
5. If the communication occurs among the same level of employees, it is called as _____ communication.

** ** **

Sub- Engg. Physics

Answer all.

1(a)   Define unit & dimension.   [2]
b)   Write unit & dimension of momentum.   [2]
c)   Write two limitations of dimensional analysis.   [2]
d)   State polygon law of vector addition.   [2]
e)   Through work is the product of two vector quantities, why it is a scalar ?
2 (a) State parallelogram law of vector addition and derive the resultant formula
       of parallelogram law of vector addition.   [5]
b)   At what angle two forces (A+B) and (A-B) should be inclined so as to have a

       resultant of $\sqrt{3A^2 + B^2}$?

** ** **

Sub- Basic Electronics

1.   **Answer any 5 of the question compulsory.**   **[2x5]**

a)   Define electron emission what are the different types of emission.

b)   Define work function – What is the value of work function of tungsten, thoriated tungsten & oxide coated.

c)   Define forbidden energy gap. What is its value for silicon & germanium.

d)   State different application of integrated circuits.

e)   Differentiate between vacuum tube and semiconductor.

f)   Write down the properties of semiconductor.

g)   Define intrinsic and extrinsic semiconductor.

2.   **Answer any two questions.**   **[5x2]**

a)   Discuss n- type semiconductor & P-type semiconductor with proper diagrams.

b)   Write short notes on integrated circuits & state uses of it & its advantages.

c)   Explain briefly the different types of electron emission with neat labeled diagram.

d)   Give the energy band description of conductors, semiconductors & insulators.

** ** **

Sub- Engg. Chemistry

1. Describe Ruther ford's Atomic Model ?   [6]
2. Briefly explain the various concept of Acid & Base.   [7]
3. Explain Bohr's Atomic Model.   [7]

** ** **

1. **Answer all the questions.** [5x4=20]

a. What do you mean by Computer & Characteristics of computer & discuss the basic parts of a computer system ?

b. What is memory hierarchy & explain the main features of different types of memory ?

c. Outline the key features of different generation of computer ?

d. What do you mean by computer software & differentiate between application software & system software.

* _*_ *

Sub- Communicative English

SECTION-A

Answer any three questions.   *[5x3=15]*
1.   Who is the author of the prose ''The portrait of a lady'' ?
2.   ''She was not pretty, but was always beautiful''. – Explain in your terms.
3.   How did the grandfather appear in his portrait ?
4.   How does the author portray his grandmother ?
5.   Why does the author say ''the thought was almost revolting''

SECTION-B

1.   Write down the synonyms of the following.   [2]
        i) Knowledge   ii) Slim
2.   Write down the antonyms of the following.   [2]
        i) Hope   ii) Adjust
3.   Mr. Ray has been living in New Delhi for the last 20 years.   [1]
        (Identify the tense.)

* _*_ *

Sub- Engg. Mechanics

1.   Answer all the questions :   [2x4]
a)   State Parallelogram law of forces.
b)   Differentiate between scalar and vector quantities with examples.
c)   What do you mean by resultant force ?
d)   Define force. What is its SI unit ?
2.   Two forces of 50N and 30N act simultaneously at a point. Find the resultant forces, if the angle between them is 60^0.   [3]
3.   What do you mean by system of forces ? Explain its different types with neat sketches.   [9]

* _*_ *

Sub- Engg. Chemistry

1. Discuss Rutherford Gold foil Experiment ?   [7]

2. Write down the various postulates of Bohr's Model of atom.   [7]

3. Answer the following.   [6]

a) Pauli Exclusion principle

b) Aufbau Principle

* _*_ *

Sub- Engg. Mechanics.

Answer all questions.

A. i)   State parallelogram law of forces .   [2]

ii)   Convert I dyne force into Kg forces.   [2]

iii)   What is free body diagram.   [2]

iv)   State theorem of transmissibility of force.   [2]

v)   Define rigid body and tension.   [2]

B)   Two forces equal in magnitude have magnitude of their resultant equal
to either. Find the angle between them.   [5]

C)   What is the resultant of two forces 6N and 8 Kgf acting at a point at an
angle of 60^0.   [5]

* _*_ *

Sub- Engg. Physics

Answer all questions.

1.a)	Define unit.	[2]
b)	Define dimension.	[2]
c)	How a vector is represented ?	[2]
d)	What are the differences between scalar & vector quantities ?	[2]
e)	Write the dimensions of pressure and stress.	[2]
2.a)	Check the correctness of formula dimensionally.	
	$S = ut + 2at^2$	[5]

b)   If
$$\acute{A} = 3\hat{\imath} + 5\hat{\jmath} - 2\hat{k}$$
$$\bar{B} = \hat{\imath} - 4\hat{\jmath} - 3\hat{k}$$

Find the angle between two vectors.   [5]

                                              Or

c)   One of the rectangular components of a force of 65N is 60N. Find the other
      component.   [5]

                        * _*_ *

1. Answer any two.   [10x2=20]
a)   If sinA = K sinB, prove that,

$$\tan\left(\frac{A-B}{2}\right) = \frac{K-1}{K+1}\tan\frac{A+B}{2}$$

b)   If A+B = 45, Prove that,

$(1+\tan A)\ (1+\tan B) = 2$, Deduce the value of $\tan 22\frac{1}{2}^0$

c)   Prove that, $\dfrac{\sin(A-B)}{\cos A.\cos B} + \dfrac{\sin(B-C)}{\cos B.\cos C} + \dfrac{\sin(C-A)}{\cos C.\cos A} = 0$

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Sub- Basic Electronics

Answer all the questions.

1.   Describe pn-junction ? Explain forward biasing and reverse biasing.   [5]

2.   Describe intrinsic and extrinsic semiconductors with respective energy band diagrams.   [5]

3.a)   Explain breakdown voltage and knee voltage.   [2]

b)   Explain minimum forward current and peak inverse voltage.   [2]

c)   Draw characteristic wave for pn junction and mark various reasons.   [2]

d)   Define majority and minority carriers.   [2]

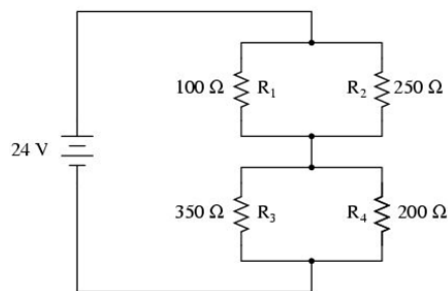e)   Define intrinsic and extrinsic semiconductors   [2]

* _*_ *

Sub- Basic Electrical

Answer all the Questions (2x5)

1. Define Ohm'Law?
2. State KVL & KCL?
3. What is resistivity?
4. Define current, voltageand their units?
5. Derive unit of resistivity?

Answer all the Questions (5x2)

1. Calculate the current in the circuit?
2. A house contain 5 tube lights of 40w running for 6 hr, 6 fans of 80w running for 10 hrs, a pump of 1HP running for 3 hrs. Calculate the bill for the month of March if per unit charges is Rs3.40

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