Sub-Math
Branch - All Branch

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
Branch - Mech. & Auto. Engg.

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.
Branch - Elect. & Civil 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
Branch - Civil & Elect. Engg.

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
Branch - All Branch

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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.
Branch - Mech. & Auto. 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
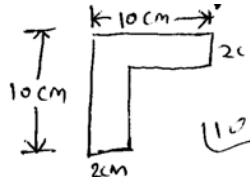**Branch - Mech. & Auto. Engg.**

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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.
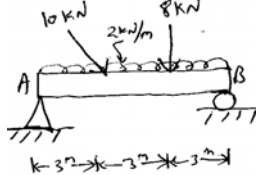e) Different between the complier and interpreter.

Sub-Engg. Mechanics
Branch - Civil & Elect. Engg.

1.   Answer all the questions.   [10x2]
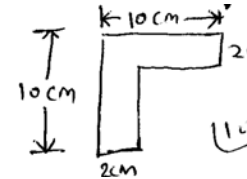a)   Determine the C.G. of following L-section.

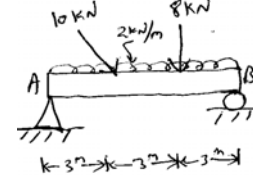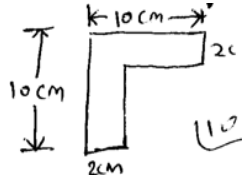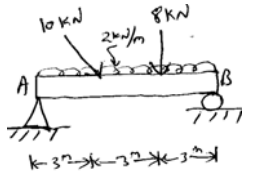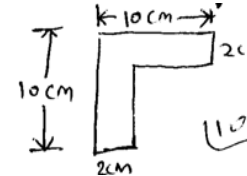b)   Determine the reactions of point A & B.