B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, SEPTEMBER 2021
I B.Tech. II Semester

ENGINEERING CHEMISTRY

(Common to EEE, ECE, CSE & IT)

Time : 3Hrs   Max. Marks : 60

Answer ONE Question from each section
All Questions carry equal marks
* * *

SECTION – I

1. (a) State and explain Heisenberg Uncertainty principle.

    (b) Discuss briefly the molecular orbital theory. Draw the molecular orbital diagram of CO molecule.

2. (a) Describe crystal field theory and apply it to tetrahedral complexes.

    (b) Write short notes on π-molecular orbitals of benzene.

SECTION – II

3. (a) What is meant by carbonate and non-carbonate hardness of water?
    (b) Calculate temporary and permanent and total hardness of sample of water containing $Ca(HCO_3)_2$ = 40.5 mg/L: $Mg(HCO_3)_2$ = 46.5 $MgSO_4$ = 27.6 mg/L: $CaCl_2$= 22.4 mg/L, $CaSO_4$ = 32.1 mg/L

    (c) What is meant by Zeolite? Give its importance.

4. (a) Describe the desalination of brakish water by electrodialysis .

    (b) Define Caustic Embrittlement. Write its chemical reactions involved.

SECTION – III

5. (a) What are fuel cells? Explain methanol–oxygen fuel cell with reaction involved.

    (b) What are the advantages of conductometric titrations ?

6. (a) What are secondary cells? Describe the construction, of Ni–Cd cell. Write cell reactions and what are its applications?

    (b) Calculate the emf of a concentration cell at 30°C consisting of two zinc electrodes dipped in Zn^{2+} solution of 0.1 N and 0.01 N concentrations. [0.0296 V]

SECTION – IV

7   (a) Define corrosion of metals and explain the mechanism of electrochemical corrosion .
    (b) Explain what happens and why does it happen when a zinc plate is attached below a ship .

8 (a) What is Pilling–Bedworth rule and give its significance?
(b) Differentiate between dry corrosion and wet corrosion .

SECTION – V

9 (a) What is polymerisation? Explain degree of polymerization.
(b) Describe the preparation, properties and uses of the Thiokol .

10 (a) Distinguish between addition and condensation polymerization.
(b) Explain preparation, properties and uses of nylons .

SECTION – VI

11 (a) Distinguish between Grass and Net calorific value of fuel.
Calculate the grass calorific value of a coal sample from the following data obtained form
(b) bomb calorimeter. Weight of coal 0.73g, weight of water in the calorimeter 1500g, water
equivalent of calorimeter 470g, initial temp 25°C and final temp. 28°C

12 (a) Explain the terms: Knocking, octane number and cetane number in respect of fuels and
their significance .
(b) Give brief account of refining of petroleum .

Code : 19SH1204

B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, SEPTEMBER 2021
I B.Tech. II Semester

ENGINEERING MATHEMATICS - II
(Common to All Branches)

Time : 3Hrs   Max. Marks : 60

Answer ONE Question from each section
All Questions carry equal marks
* * *

SECTION – I

1. a) Evaluate $\displaystyle\int_0^a \int_0^{\sqrt{a^2-y^2}} \sqrt{a^2-x^2-y^2}\ dx\ dy$

    b) Evaluate $\displaystyle\int \int (x^2+y^2)\ dx\,dy$ in the positive quadrant for which $x+y \le 1$

2. Change the order of integration and evaluate $\displaystyle\int_0^{4a} \int_{x^2/4a}^{2\sqrt{ax}} dy\,dx$

SECTION – II

3. a) Evaluate $\displaystyle\int_0^a \int_0^x \int_0^{x+y} e^{x+y+z}\ dx\,dy\,dz$

    b) Evaluate $\displaystyle\int_0^{\infty} e^{-2x}\cdot x^{5/2} dx$

4. Show that $\displaystyle\int_0^1 x^m (\log x)^n\ dx = \frac{(-1)^n\, n!}{(m+1)^{n+1}}$ where 'n' is a positive integer and $m > -1$

SECTION – III

5. Find the angle between the surfaces $x^2+y^2+z^2=9$ and $z=x^2+y^2-3$ at the point $(2, -1, 2)$.

6. a) Evaluate $\nabla.\left(\dfrac{\bar{r}}{r^3}\right)$ where $\bar{r} = xi + yj + zk$ and $r = |\bar{r}|$

    b) Show that the vector $\bar{f} = (x^2 - yz)\bar{i} + (y^2 - zx)\bar{j} + (z^2 - xy)\bar{k}$ is Irrotational

SECTION – IV

7   Find the work done by the force $\bar{F} = (2y+3)i + (zx)j + (yz-x)k$ when it moves a particle from the point (0, 0, 0) to (2, 1, 1) along the curve $x = 2t^2, y = t, z = t^3$.

8   Using Divergence theorem, evaluate

$\iint\limits_{S} (x\,dy\,dz + y\,dz\,dx + z\,dx\,dy)$, where $x^2 + y^2 + z^2 = a^2$.

SECTION – V

9   Obtain the Fourier series expansion of $f(x)$ given that $f(x) = (\pi - x)^2$ in $0 < x < 2\pi$ and

hence deduce that $\dfrac{1}{1^2} + \dfrac{1}{2^2} + \dfrac{1}{3^2} + \ldots = \dfrac{\pi^2}{6}$.

10   Find the Fourier series of the periodic function defined as $f(x) = \begin{cases} -\pi, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{cases}$ and

hence deduce that $\dfrac{1}{1^2} + \dfrac{1}{3^2} + \dfrac{1}{5^2} + \ldots = \dfrac{\pi^2}{8}$.

SECTION – VI

11   Using Fourier integral, show that $\displaystyle\int_{0}^{\infty} \dfrac{\lambda^2 + 2}{(\lambda^4 + 4)} \cos \lambda x \, d\lambda = \dfrac{\pi}{2} e^{-x} \cos x$

12   Find the Fourier transform of $f(x)$ defined by $f(x) = \begin{cases} 1-x^2, & |x| \le 1 \\ 0, & |x| > 1 \end{cases}$ and hence evaluate

$\displaystyle\int_{0}^{\infty} \dfrac{x\cos x - \sin x}{x^3} dx$

B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, SEPTEMBER 2021
I B.Tech. II Semester

PYTHON AND DATA STRUCTURES
(Common to CSE & IT)

Time : 3Hrs   Max. Marks : 60

Answer ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1. (a) What is an operator? Discuss different types of python operators with an example.

   (b) Explain the various data types in python with an example.

2. (a) Describe the features of Python.

   (b) Write a Python program to find whether the given year is leap year or not.

SECTION – II

3. (a) Illustrate the various decision making statements with a syntax and example.

   (b) Explain the various loop control statements.

4. (a) Define error and exception. Distinguish between these two features.

   (b) Elaborate user defined exceptions in Python.

SECTION – III

5. Briefly explain about tuples in Python.

6. (a) What are built-in dictionary functions? Explain.

   (b) Explain about immutable constraints and frozen sets.

SECTION – IV

7. What is a data structure? Explain different types of data structures with a neat diagram.

8. Write an algorithm for selection sort.
   Sort the following list of elements by using selection sort.
   14,28,46,10,35,54,5,17

SECTION – V

9   What is a Linked list? Illustrate the various operations of single linked list in detail with a neat diagram.

10   Explain the properties of Binary Tree. Given in order traversal of a binary tree is D,G,B,E,A,H,F,I,C and pre order traversal is A,B,D,G,E,C,F,H,I construct binary tree?

SECTION – VI

11   What is a Stack? Explain the implementation and operations of a stack.

12 (a) Explain the implementation of Queue using Python list.

     (b) Evaluate the following postfix expression:
14 9 10 + - 11 6 4 / + * 5 / 8 +.

B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, SEPTEMBER 2021
I B.Tech. II Semester

DATA STRUCTURES
(Common to EEE & ECE)

Time : 3Hrs   Max. Marks : 60

Answer ONE Question from each section
All Questions carry equal marks
* * *

SECTION – I
1. a) Define data structure. Explain in detail about the classification of data structure.
   b) Write the applications of stacks.
2. a) Explain about the push and pop operations in a stack implemented using linked list with node diagrams.
   b) List the advantages and disadvantages of stacks.
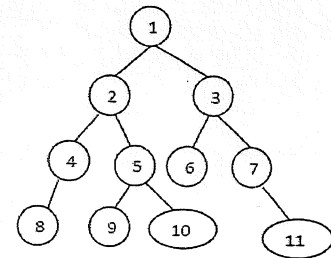
SECTION – II
3. a) Define Queue. How can you represent queue using array? Explain with an example.
   b) Explain in detail about priority queues with an example.
4. Describe in detail about Round Robin algorithm with an example.

SECTION – III
5. a) Write a function to count the number of nodes in a double linked list.
   b) What are the advantages and disadvantages of linked list?
6. Write a program to eliminate duplicate elements in a singly linked list.

SECTION – IV
7. Consider the binary tree and answer the following:
   i. What is a leaf node and find the number of leaf nodes in the given tree?
   ii. How many of the nodes have at least one sibling?
   iii. Find In-order pre-order and post order traversals.

8. Describe in detail about representation of sets with examples.

SECTION – V
9. Define graph data structure. Explain about Dijikstra algorithm with suitable example.
10. What are the applications of graph? Explain in detail about Kruskal's algorithm with an example.

SECTION – VI
11. Write the pseudocode for MergeSort technique. Consider the given elements 9,7,8,3,2,1. Explain the process of sorting the elements using merge sort.
12. Write a program to implement binary search algorithm. Explain the process of searching for element 6 in the given array of elements: 2,6,8,13,16,20,22,25 using binary search technique.

B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, SEPTEMBER 2021
I B.Tech. II Semester

ENGINEERING MECHANICS
(Civil Engineering)

Time : 3Hrs   Max. Marks : 60

*Answer **ONE** Question from each section*
All Questions carry equal marks
* * *

SECTION - I

1.   Two forces P and Q act at a point at such an angle that their resultant is P. Prove that if P is replaced by 2P, the new resultant will be perpendicular to Q.

2.   A beam 6 m long is simply supported at the ends. It carries a distributed load varying from zero at the right hand end to 200kN/m at the left hand end. Determine the reaction at the supports.

SECTION – II

3. (a) State the laws of rolling friction.

    (b) Define the terms with the help of neat sketches.
         (i) Sliding friction   (ii)Static friction

4.   Find the force acting parallel to the inclined plane required to draw a weight of 60kN up the plane, the inclination of the plane being such that a force of 10kN inclined to the plane at an angle of 30^0 could support it if the plane were smooth. Take μ=0.25 on the rough plane.

SECTION – III

5.   Determine the centroid of a T section having the following dimensions:
         Flange – 150mm x 10mm
         web – 290mm x 10mm

6.   An I section has the following dimensions:
         Top flange –10 cm x 2cm
         Bottom flange – 15 cm x 2 cm
         Web – 12cm x 2cm
      Over all depth of the section is 16cm
      Determine the moment of inertia of the I section about two centroidal axes.

SECTION – IV

7 (a) Draw neat sketches showing displacement-time graph for
            (i) Motion with uniform velocity   (ii) Motion with uniform acceleration

   (b) A bullet loses half its velocity after penetrating 6 cm through a fixed target. How far will it further penetrate?

8   A particle moving with uniform acceleration passes 75 m and 98 m in the eleventh and fifteenth second respectively of its motion. Determine the displacement of the particle in the first 20 seconds.

SECTION – V

9   A lift is ascending vertically at the rate of 2m/s. A screw drops from the lift all of a sudden. What will be the velocity of the screw at the end of 3 seconds and what will be the distance between the lift and the screw at the moment?

10   The following Fig.01 shows that a frame A is accelerated to the left at 5 m/s^2. Bar B is hinged at C and its top rests against the smooth vertical surface at D. the frame A weighs 320N and the bar B weighs 80N. Find the horizontal force P and the horizontal push on the bar at D.
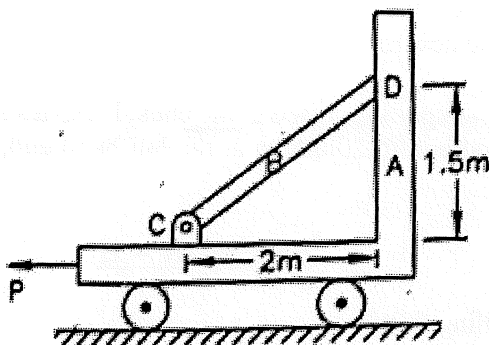
Fig.01

SECTION – VI

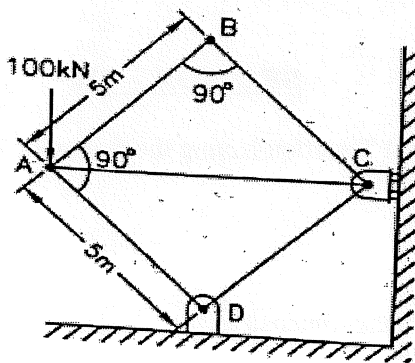11   Determine the forces in each member of the plane truss loaded and supported as shown in Fig.02.

Fig.02

12   A particle has simple harmonic motion. Its maximum velocity was 8 m/sec and the maximum acceleration was found to be 12 m/sec^2 . Determine its angular velocity, amplitude. Also determine its velocity and acceleration when displacement is half of the amplitude.

B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, SEPTEMBER 2021
I B.Tech. II Semester

ENGINEERING MECHANICS – II
(Mechanical Engineering)

Time: 3Hrs   Max. Marks: 60

Answer ONE Question from each section
All Questions carry equal marks
* * *

SECTION – I

1. (a) A body is moving with uniform acceleration and covers 15m in fifth second and 25m in tenth second. Determine the initial velocity of the body and the acceleration of the body.

   (b) A particle starting from rest, moves in a straight line, whose acceleration is given by the relation $a = 10 - 0.006 s^2$, where 'a' is in m/s^2 and 's' in meters. Determine the velocity of the particle when it has travelled 50m and distance travelled by the particle when it comes to rest.

2. (a) A stone is dropped into a well, sound of splash is heard after 4.5 seconds. Another stone is dropped with an initial velocity, 'v' and the sound of splash is heard after 4 seconds. If the velocity of the sound is 336 m/sec, determine the initial velocity of the second stone.

   (b) The rectilinear motion of a particle is defined by displacement time relationship, $X = X_o [2e^{-kt} - e^{-2kt}]$ where X_o is the initial displacement. Find the time at which the velocity is maximum and also the maximum velocity.

SECTION – II

3. (a) A flywheel is making 180 r.p.m. and after 20 seconds it is running at 120 r.p.m. How many revolutions will it make and what time will elapse before it stops, if the retardation is uniform.

   (b) The crank and connecting rod of a steam engine are 0.5m and 2m respectively. The crank makes 180 r.p.m. in the clockwise direction. When the crank has turned 45^0 from the inner dead centre, determine velocity of the piston and angular velocity of the connecting rod.

4. (a) The angular acceleration of a flywheel is given by $\alpha = 12 - t$, where α is in rad/sec^2 and t in seconds. If the angular velocity of the flywheel is 60 rad/sec at the end of 4 seconds, determine the angular velocity at the end of 6 seconds. How many revolutions take place in these 6 seconds.

   (b) The rocket is released from a jet fighter flying horizontally at 1100 m/sec at an altitude of 8000m above its target. The rocket thrust gives it a constant horizontal acceleration of 0.6g. Determine the angle between the horizontal and the line of sight to the target.

SECTION – III

5.   Two rough planes inclined at 30° and 60° to the horizontal are placed back to back as shown in Fig.1. The blocks of weights 50 N and 100N are placed on the faces and are connected by a string running parallel to planes and passing over a frictionless pulley. If the coefficient of friction between planes and blocks is 0.2, find the resulting acceleration and tension in the string.
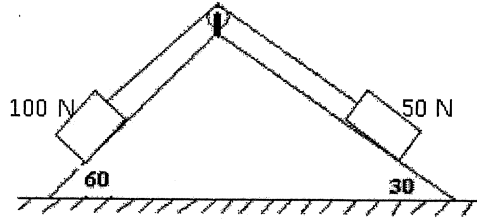

Fig.1.

6.   The weights of three blocks shown in Fig.2. are $W_A = 100N$, $W_B = 200N$ and $W_C = 200N$. Coefficient of friction between block A and the floor is 0.20 and between floor and block C is 0.25. Assuming pulleys are frictionless and weightless, determine the acceleration of each block.
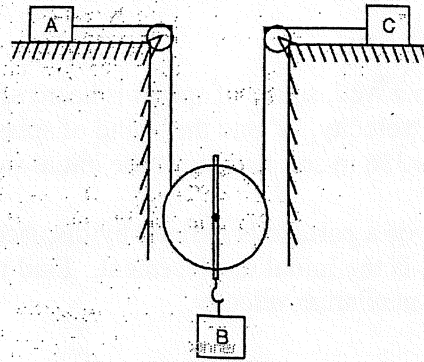

Fig.2.

SECTION – IV

7   (a)   Define linear impulse and linear momentum and derive the governing expression for impulse-momentum equation.

    (b)   The initial velocity of 500N block is 6 m/sec towards left. At this stage a weight of 250N is applied as shown in Fig.3. Determine the time at which the block has (i) no velocity (ii) a velocity of 4 m/sec to the right. Take coefficient of friction as 0.20 and assume pulley is frictionless.
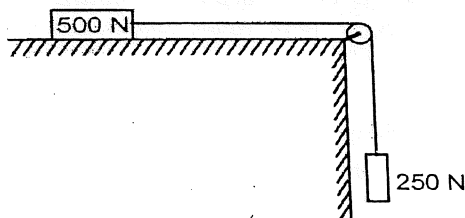

Fig.3.

8 (a) Name the different types of impacts and illustrate those through appropriate sketches.

   (b) A sphere collides directly with similar sphere which is at rest. Show that their velocities after the impact confirm to the ratio **(1 - e) / (1 + e)** where e is the coefficient of restitution.

SECTION – V

9 (a) Derive the governing expression for work energy equation for translation.

   (b) Block A of mass 35 kgs rests on a smooth inclined plane and connected Block B of mass 80 kgs as shown in Fig.4. If the system is released from rest, determine their velocities after the block B descends a distance of 0.5 m.
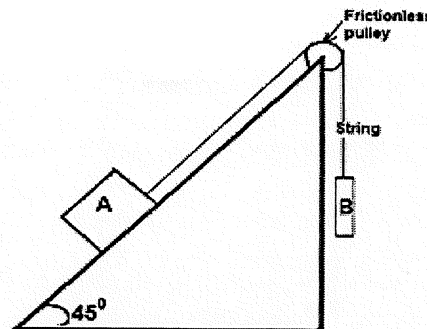

Fig.4.

10 (a) State the principle of virtual work. Explain it by giving a suitable example.

   (b) A simply supported beam AB of span 5m carries two point loads of 10 kN and 15 kN at 2m and 3m from the left support A. Determine the beam reactions by the principle of virtual work.

SECTION – VI

11 (a) Derive the relationship between the three elastic constants E, N and K.

   (b) A circular rod of 25 mm diameter and 500 mm long is subjected to a tensile force of 60 kN. Determine modulus of rigidity, bulk modulus and change in volume if Poisson's ratio =0.3 and Young's modulus $E = 2 \times 10^5$ N/mm^2.

12 A copper bar 50 mm in diameter is placed within a steel tube 75 mm external diameter and 50 mm internal diameter of exactly the same length. The two pieces are rigidly fixed together by two pints 18 mm in diameter, one at each end passing through the bar and tube. Calculate the stresses induced in the copper bar, steel tube and pins if the temperature of the combination is raised by 50^0 C.

B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, SEPTEMBER 2021
I B.Tech. II Semester

BUILDING MATERIALS & CONSTRUCTION
(Civil Engineering)

Time: 3Hrs   Max. Marks : 60

Answer ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1. (a) What are the characteristics of a good building stone?

   (b) Describe the tests performed to check the quality of bricks.

2. (a) How is artificial stone prepared? What are its different forms?

   (b) Describe the process of manufacturing glass.

SECTION – II

3. (a) What are the important properties of cement?

   (b) What are the tests carried out for sand?

4. (a) Explain the classification of aggregate in detail.

   (b) Write the difference between grouting and guniting.

SECTION – III

5. (a) What do you understand by a shallow foundation? Draw neatly sketches of any two types of shallow foundation.

   (b) Enumerate various types of surface finishes used in stone masonry.

6.   Define a cavity wall. What are its advantages? Explain with the help of neat sketches, and general features of a cavity wall.

SECTION – IV

7   Discuss various modes of failures of an arch. And write clearly the remedies.

8 (a) How the sizes of doors and windows are fixed?

   (b) Discuss the various considerations made in planning of stair cases.

SECTION – V

9   List out different classification of pitched roofs and with the help of neat sketches explain any two types of pitched roof in detail.

10 (a) What do you understand by scaffolding? What are the essential requirements?

     (b) Explain Indian Standard Specifications for
            (i) Cleaning and treatment of forms   (ii) Stripping time.

SECTION – VI

11 (a) Explain in detail the objects of plastering and pointing.

     (b) Explain how do you achieve thermal insulation of roofs.

12   Discuss in brief general principles and factors in acoustical design of a hall.

Code: 19EE1202

B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, SEPTEMBER 2021
I B.Tech. II Semester

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Mechanical Engineering)

Time: 3Hrs   Max. Marks: 60

Answer ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1. (a) List the differences between active and passive elements.

   (b) Two resistances when they are in series have a equivalent resistance of 9 ohms and when connected in parallel have an equivalent resistances of 3 ohms. Find the two resistances.

2. (a) State Ohm's law. Mention its limitations.
   (b) Determine the current flowing in 4 ohms resistor shown in figure using mesh analysis.
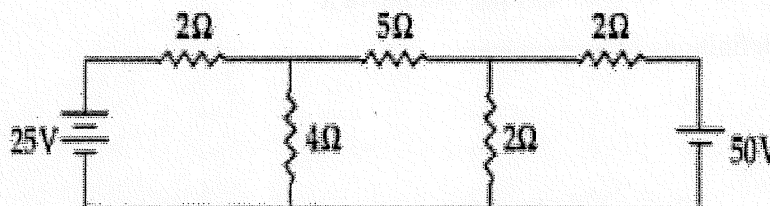
SECTION – II

3. (a) Show that current in pure capacitive circuit leads the voltage by 90 degrees.
   (b) Derive the RMS and Average values for Full wave rectifier voltage waveform.

4. (a) Explain RL series circuit in detail with phasor diagram.
   (b) A resistance of 50 Ω and a capacitor of 100 μF are connected in series. The supply voltage to the circuit is 200V at 50Hz. Calculate the voltage across the resistor and the capacitor. Also calculate current flowing through the circuit.

SECTION – III

5. (a) What are half-power frequencies in a series RLC resonance circuit? Derive an expression for bandwidth of the circuit.
   (b) A series RLC circuit consists of 50 Ω resistance, 0.2 H inductance and 12μF capacitance with the applied voltage of 30V. Determine the resonant frequency, the Q-factor, the lower and upper frequency limits and the bandwidth of the circuit.

6. (a) Define the band width in resonant circuit. List the characteristics of RLC parallel resonant circuits.
   (b) An inductance coil of resistance 10 Ω and inductance 0.2 H is connected in parallel with a 140 μF capacitor to a variable frequency 200V supply. Find the resonant frequency at which the total current taken from the supply is in phase with the supply voltage. Also find the value of current. Draw the phasor diagram.

SECTION – IV

7 Define forward static and dynamic resistances of diode. Explain operation of forward biased diode and draw its V-I characteristics.

8 What is tunnel diode? Explain the tunneling effect with the help of neat diagram.

SECTION – V

9 (a) Draw and explain circuit diagram of half wave rectifier.

   (b) Define the ripple factor. Show that the ripple factor of a full-wave rectifier is 0.482.

10 Name the different types of filters. Draw the circuit of in CLC filter and explain filter action with neat waveforms.

SECTION – VI

11 (a) Explain the working of PNP transistor. Draw the standard symbol.

    (b) Obtain the expression for the collector current of transistor in common emitter configuration

12 (a) Give relationship between α_{dc}, β_{dc} and prove it

    (b) Give the definitions of h-parameters.

B.TECH. DEGREE SUPPLEMENTAY EXAMINATION, SEPTEMBER 2021
I B.Tech. II Semester

CIRCUITS & NETWORKS
(Electrical & Electronics Engineering)

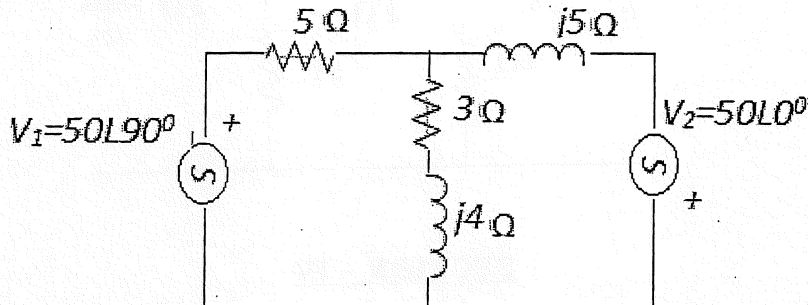Time : 3Hrs   Max. Marks : 60

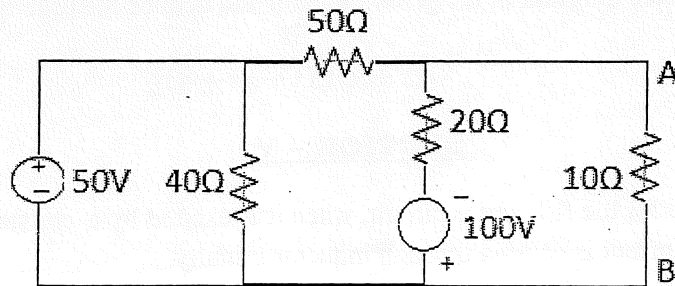*Answer ONE Question from each section*
All Questions carry equal marks
* * *

SECTION - I

1. a. State and explain Maximum power transfer theorem

   b. By applying superposition theorem to the network shown in figure and obtain the current in the $(3+j4)\Omega$ impedance.

2. a. State and explain Milliman's theorem

   b. Determine the Thevenin's equivalent across AB terminals shown in figure

SECTION – II

3. a. With the help of phasor diagram, explain the relation between the line and phase quantities of a star connected load

   b. A balanced star connected load is supplied from a symmetrical 3 phase, 400V system. The current in each phase is 30A and lags 300 behind the phase voltage. Find
   i) The phase voltages ii) The line voltages iii) The total power. Take RYB sequence

4. a. Explain Two watt meter method using Phasor diagram

   b. A three phase, three wire symmetrical 440V source is supplying power to an unbalanced, delta connected load in which $Z_{RY}=20 \angle 30^0\Omega$, $Z_{YB}=20 \angle 0^0 \Omega$, and $Z_{BR}=20 \angle -30^0 \Omega$. If the phase sequence is RYB, calculate the line currents.

SECTION – III

5. a. Voltage V_1 and V_2 at the ports of a two port network are given by the equation
   $V_1= 60I_1 + 20I_2$
   $V_2= 20I_1 + 40I_2$.
   Find the Z and Y parameters of the network.

   b. Define Reciprocity & symmetry for a generalized two port network and derive the condition for reciprocity and symmetry in terms of Z-parameters.

6. Obtain Transmission line parameters and h-parameters for the network shown in figure
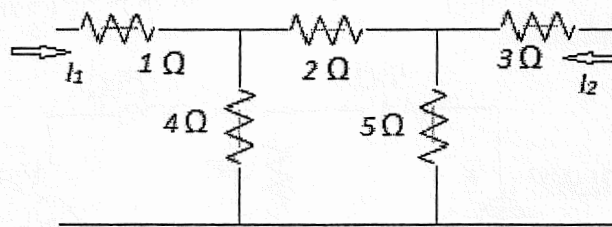
SECTION – IV

7 Write the Necessary conditions for driving point functions & transfer function

8 a. What are the restrictions on the location of poles and zeros?

   b. Obtain the pole-zero diagram of the given function and deduce the time domain response.
 $$I(s) = \frac{5s}{[(s + 1)(S^2 + 2s + 4)]}$$

SECTION – V

9 a. Find the response for the R-L series circuit, when it is excited by a constant voltage V. Assume that no current is passing through inductor initially.

   b. In the network shown below, the switch is closed at t=0 with the capacitor is uncharged initially, find the value of i, $\frac{di}{dt}, \frac{d^2i}{dt^2}$ at t=0$^+$
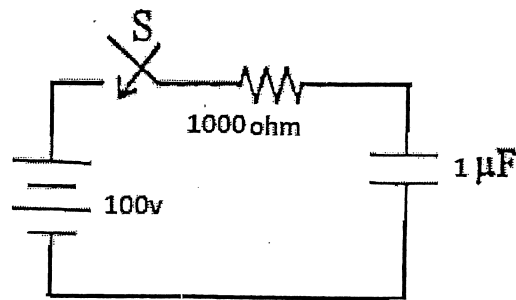
10 Find the response of RLC series circuit. When the switch 'S' is closed at t=0 and is excited by a constant voltage source V.

SECTION – VI

11 When RC series circuit is excited by a sinusoidal voltage at t=0, Derive the current expression for t > 0.

12 In the circuit shown in figure, the switch S_1 is closed at t=0 & Switch S_2 is opened at t = 4 ms obtain current for t > 0 using Laplace Transformations.
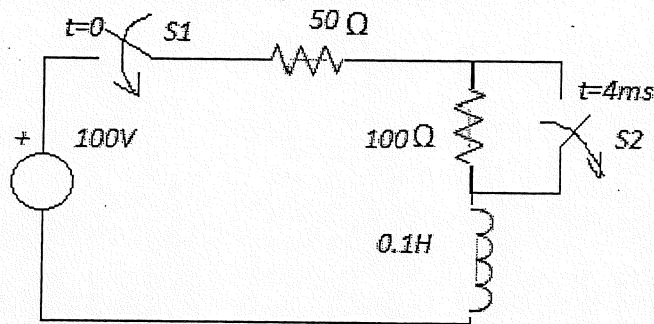
B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, SEPTEMBER 2021
I B.Tech. II Semester

DATABASE MANAGEMENT SYSTEMS
(Common to CSE & IT)

Time : 3Hrs

Max. Marks : 60

Answer ONE Question from each section
All Questions carry equal marks
* * *

SECTION-I

1. Explain three schema architecture with neat diagram
2. Describe the key responsibilities of Database Administrator

SECTION-II

3. Describe the various components of ER Diagram
4. Explain the different relational operations.

SECTION-III

5. Explain the following in SQL query
   i) Select   ii) from   iii) where   iv) Distinct
6. Write short notes on Nested Queries and Correlated Nested Queries

SECTION-IV

7. Give a detailed description about decomposition using functional dependency.
8. Describe about Atomic domain and first normal form

SECTION-V

9. Assess the overview of physical storage media: cache memory, flash memory, main memory, magnetic disk storage.
10. What is meant by hashing? Differentiate static hashing and dynamic hashing

SECTION-VI

11. What is transaction? Explain the properties of transaction
12. What do you mean by Serializability How can you test for Serializability

B.TECH. DEGREE SUPPLEMENTARY EXAMINATION, SEPTEMBER 2021
I B.Tech. II Semester

ENGINEERING PHYSICS
(Common to CE & ME)

Time : 3Hrs   Max. Marks : 60

Answer ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1. (a) Mention the importance of Diffraction grating.

   (b) With necessary theory explain Newton's rings due to reflected light.

2. (a) Describe the construction and working of He–Ne laser.

   (b) Mention Properties of laser beam.

SECTION – II

3. (a) What is meant by Black body radiation?

   (b) Derive Plank's radiation formula.

4. (a) Describe the behavior of a Particle in a one dimensional potential box.

   (b) Calculate the wavelength associated with an electron raised to a potential of 1600V.

SECTION – III

5. (a) Mention the merits of quantum free electron theory.

   (b) Explain the behavior of electron in a varying periodic potential fields using Kronig–Penny model.

6. (a) Distinguish between drift and diffusion process in a semiconductor.

   (b) Derive Einstein relation for a semiconductor.

SECTION – IV

7 (a) Write a short note on electronic polarization of a dielectric.

  (b) Derive the expression for Internal field in a polarized dielectric.

8 (a) Explain the Origin of magnetic moment in an atom.
  (b) Mention the applications of magnetic materials.

SECTION – V

9 (a) Mention the important characteristics of Simple harmonic motion.

     (b) Explain the principle of Torsional pendulum along with its applications.

10 (a) Describe the analytical treatment of forced oscillations.

     (b) Write a shot note on Q-factor.

SECTION – VI

11 (a) Explain the working principle of optical fiber.

     (b) Describe the Block diagram of optical fiber communication system.

12 (a) Mention the different types of nanomaterials.

     (b) Explain the synthesis of nanomaterials by Ball milling method.

B.TECH. DEGREE SUPPLEMENTARY EXAMINATION,   SEPTEMBER 2021
I B.Tech. II Semester

PROFESSIONAL ENGLISH
(Common to All Branches)

Time : 3Hrs   Max. Marks : 60

Answer ONE questions from each section
All questions carry equal marks.

* * *

SECTION - I

1. (a) Describe the process of hydroelectricity generation.

   (b) Rewrite the following statements by choosing the suitable analogy from shown brackets.
   1. Monk: Monastery:: (Noble: House/ Lion: Cave/ Nun: Convent/ Peasant: Village
   2   Story: Novel:: (Sea: Ocean/ School: University/ Book: Dictionary/ Poetry:Drama)
   3   Poverty: Prosperity:: (Love: Sorrow/ Train: Cart/ Rain: Flood/ Intelligence: Stupidity)
   4   Kangaroo: Australia :: (Whale: River/ Elephant: Russia/ Penguin: Antarctica/ India: Peacock)

2. (a) Describe the structure of atom and explain how nuclear energy is generated.

   (b) Write the meanings and make the sentences by using the following homonyms.
   1   Bridal/ bridle
   2   Faze/ phase
   3   Naval/ navel
   4   Anecdote/ antidote

SECTION – II

3. (a) Write the advantages and disadvantages of e-mail writing.

   (b) Write the meanings of the following idioms and use them in your own sentences.
   (i)   Once in a blue moon   (ii)   Burn the midnight oil
   (iii) To judge a book by its cover   (iv)   Strike while the iron is hot

4. (a) What are do's and don'ts of effective e-mail writing?

   (b) Write the meanings of the following one word substitutes.
   (i) Barometer   (ii) Encyclopaedia   (iii) Infanticide   (iv) Pandemic

SECTION – III

5. (a) Analyze the following issue.
         " Covid-19 has brought revolutionary changes in online education"

   (b) Write the right words by using the following prefixes.
         (i) Mal-   (ii) Poly-   (iii) Post-   (iv) Tetra-

6. (a) Analyze the following argument.

Playing PUBG leads to several psychological disorders in the youth. So it should be banned throughout the world.

(b) Write the right words by using the following suffixes.

    (i) –acy   (ii) –ical   (iii) –logy   (iv) –ify

SECTION – IV

7. (a) What is a project proposal and discuss the basic guidelines in preparing a project proposal?

(b) Write synonyms to the following words.

    (i) Chaos   (ii) Fabulous   (iii) Mischievous   (iv) Adequate

8. (a) You are planning to organize a seminar in your institute on 'Need of Environment Protection'. Prepare a seminar proposal (including budget, importance and proposed dates) to Department of Science and Technology (DST) on 'Solar Energy'

(b) Write antonyms to the given words.

    (i) Vital   (ii) Worthy   (iii) Vanity   (iv) Pious

SECTION – V

9 (a) What are the advantages of Note- Taking and Note- Making?

(b) Write any eight words of your choice which are often confused.

10 (a) Discuss few techniques in taking notes during a seminar on a technical topic.

(b) Write any eight words of your choice which are often confused.

SECTION – VI

11 (a) Discuss the important features in reviewing a Technical book.

(b) Complete the following sentences by choosing one from the given options.
1. The two brothers look so _____ that it is difficult differentiate them.
    A. same   B. similar   C. identical   D. alike
2. Every week, in the office, one hour is _____ to games and sports.
    A. conferred   B. dedicated   C. conceded   D. devoted
3. Some people _____ themselves into believing that, they are the only honest and hardworking employees in the company.
    A. keep   B. fool   C. delude   D. force
4. The bus met with an accident and was _____ the traffic, so he had a hard time driving through the downtown.
    A. obstructing   B. obviating   C. hiding   D. disturbing

12 (a) Write a review on any book you have read recently.

(b) Complete the following sentences using appropriate forms of the words given in the brackets.
1 He is the............... (clever) of the two.
2. It is strange but often water is more ----------- (expense) than alcohol.
3. ------- (buy) my ticket was expensive, but it was worth it. I enjoyed my visit to the circus.
4. On looking----------- (careful), we found a fish with its tail tied around some algae