MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Advance Supplementary Examinations, June 2019
Basic Electrical Engineering
(EEE, ECE, CSE&IT)

Roll No										

Time: 3 hours   **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1   (a) State and explain Kirchhoff's Laws   **[7M]**

     (b) Write short notes on source transformation with example   **[7M]**

OR

2   (a) Write a short notes on independent and dependent sources   **[7M]**

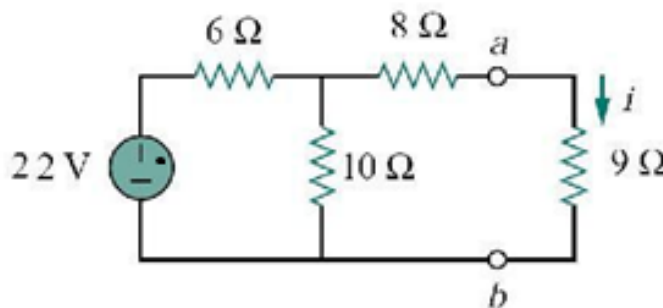   (b) What are the various elements in electrical networks and their energy calculations   **[7M]**

SECTION-II

3   (a) State and explain Superposition Theorem.   **[7M]**

     (b) Calculate the current in the 50Ω resistor in the network shown in the figure using mesh analysis   **[7M]**
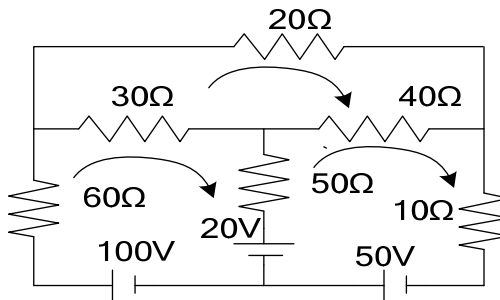
OR

4   (a) State and explain Norton's Theorem.   **[7M]**

     (b) Using Thevenin's Theorem, find the current "i" in 9Ω Resistor.   **[7M]**

SECTION-III

5   (a) A circuit consists of a series connected resistance of 10 ohms a capacitance of   **[7M]** 150µ F and an inductance of 16mH connected across a supply of 100V at 50Hz. Evaluate (a) circuit current (b) power factor and (c) power consumed by the circuit. Draw the phasor diagram.

     (b) Derive RMS value of a sinusoidal waveform.   **[7M]**

<div align="center">OR</div>

6   (a) Explain about series R-L circuit with AC input.   **[7M]**

     (b) Derive Average value of a sinusoidal waveform.   **[7M]**

SECTION-IV

7   (a) Derive the E.M.F. equation of a DC generator.   **[7M]**

     (b) Explain the construction of single phase transformers   **[7M]**

<div align="center">OR</div>

8   (a) Explain the principle of operation of a D.C. generator.   **[7M]**

     (b) Derive the E.M.F. equation of a single phase transformer   **[7M]**

SECTION-V

9   (a) Compute the energy consumption in a system that consumes 190 Watts of   **[7M]** power and works for 3 hrs a day.   **[7M]**

     (b) Write short notes on Wires and Cables

<div align="center">OR</div>

10   (a) Write short notes on Switch Fuse Unit (SFU) and MCB.   **[7M]**

     (b) Explain about the operation of earth leakage circuit breaker (ELCB)   **[7M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Advance Supplementary Examinations, June 2019
Engineering Chemistry
(EEE, ECE, CSE & IT)

Roll No										

Time: 3 hours   **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1 (a) Explain the construction and working of H_2-O_2 fuel cell and give advantages and applications of fuel cells.   **[7M]** **[7M]**
   (b) Explain the method of galvanizing.

OR

2 (a) Discuss in detail about Lead-acid battery with cell reactions.   **[7M]**
   (b) Explain the mechanism of electrochemical corrosion with suitable example.   **[7M]**

SECTION-II

3 (a) Give the important postulates of molecular orbital theory.   **[4M]**
   (b) Explain the molecular orbital energy level diagrams of N_2 and O_2.   **[10M]**

OR

4 (a) What are the salient features of Crystal Field Theory?   **[4M]**
   (b) Explain the crystal field splitting of transition metal ion d-orbitals in octahedral geometry   **[10M]**

SECTION-III

5 (a) Explain the estimation of hardness of water by EDTA method.   **[10M]**
   (b) What is hardness of water? Explain units of hardness   **[4M]**

OR

6 (a) Explain the method of softening of water by Ion-Exchange process.   **[8M]**
   (b) How the desalination of water can be done by Reverse Osmosis.   **[6M]**

SECTION-IV

7 (a) Explain the mechanism of S_N^1 reaction with a suitable example.   **[7M]**
   (b) Write short note on anti-Markownikoff's addition with an example.   **[7M]**

OR

8 (a) Explain the mechanism for Markownikoff's addition of HBr to Propene.   **[6M]**
   (b) Write short notes on dehydrohalogenation of alkyl halides.   **[4M]**
   (c) Give a brief note on oxidation of alcohols using $KMnO_4$ with a suitable example.   **[4M]**

SECTION-V

9 (a) What are the characteristics of a good fuel?   **[3M]**
   (b) Explain the proximate analysis of Coal with its significance.   **[7M]**
   (c) Write short notes on Octane number and Cetane numbers.   **[4M]**

OR

10   (a) Explain the Refining of petroleum with a neat diagram.   **[8M]**

        (b) Give a brief note on fluid bed catalytic cracking with a neat sketch.   **[6M]**

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Roll No										

Time: 3 hours 　　　　　　　　　　　　　　　　　　　　　　　**Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

Q.No.1.

Construct a parabola when the distance between the focus and the directrix is 30 mm. Draw a tangent and normal at any point on the curve. [14M]

(OR)

Q.No.2

A circle of 45 mm diameter rolls inside another circle of 180mm diameter for one revolution. Draw the locus of a point, which is at a distance of 20 mm from the center of the rolling circle. [14M]

SECTION-II

Q.No.3

Draw the projections of the following points on the same ground line *xy*; keeping the distance between the projectors is 30mm, Name the quadrants in which they lie.

　　　　　　(i) Point A, on V.P. and 40mm above the H.P.

　　　　　　(ii) Point B, 35mm above the H.P. and 55mm behind the V.P.

　　　　　　(iii) Point C, 35mm below the H.P. and 50mm front the V.P.

　　　　　　(iv) Point D, 20mm below the H.P. and 40mm behind the V.P.

　　　　　　(v) Point E, 50mm below the H.P. and on V.P. [14M]

(OR)

Q.No.4

A line PQ, 65mm long has its end P 45mm above the H.P and 25mm in front of V.P. It is inclined at 45^0 to the H.P and 55^0 to the V.P. Draw its projections. [14M]

SECTION-III

Q.No.5

A pentagon ABCDE of side 35 mm is kept with side AB in the H.P and inclined at 45° with the V.P. Surface is inclined at $30^°$ to the H.P. Draw the projections of the pentagon. [14M]

(OR)

Q.No.6

Draw the projections of A square pyramid, all edges of the base equally inclined to the HP and the axis parallel to and 50 mm away from both the HP and VP. Side of the base 35 mm long and the axis 70 mm long. [14M]

SECTION-IV

Q.No.7

Draw the isometric projection of a square prism of side of base 35 mm and height 65 mm when its axis is (i) vertical and (ii) horizontal [14M]
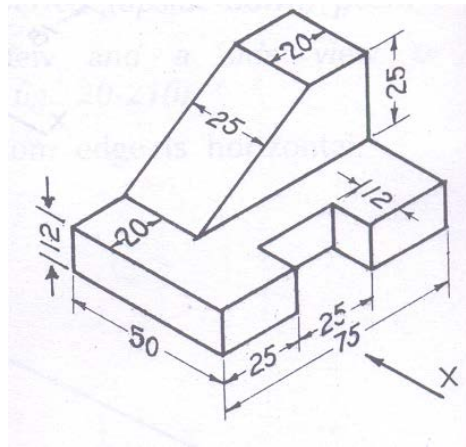
(OR)

Q.No.8

A sphere of radius 20 mm is kept on the top face of a square prism of side of base 40 mm and height 20 mm. The two solids have the common axis. Draw the isometric projection of combination of solids. [14M]
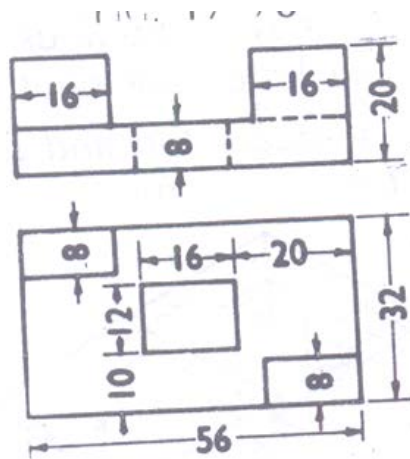
SECTION-V

Q.No.9 Draw front view, top view and side view of the given figure. (All dimensions in mm)
[14M]

(OR)

Q.No.10

Draw the isometric drawing for the below orthographic views. (All dimensions in mm) [14M]

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Advance Supplementary Examinations, June 2019
Engineering Physics
(ME & AE)

Roll No										

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　　**Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE
Question from each SECTION and each Question carries 14 marks.
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SECTION-I
1 a) Define the simple harmonic motion. What are the characteristics of SHM?　**[7M]**
   b) Explain the phasor model in SHM　**[7M]**
　　　　　　　　　　　　　　　　OR
2 a) Distinguish between free and forced oscillations　**[4M]**
   b) Derive the differential equation and its general solution in damped harmonic
      electrical oscillator and discuss special cases　**[10M]**
　　　i) Under damped　ii). Over damped　iii) Critical damped
SECTION-II
3 a) What are the necessary conditions for obtaining the interference fringes　**[4M]**
   b) Explain the formation of Newton's rings with suitable experimental
      arrangement.　**[5M]**
   c) Derive an expression for wavelength of light in Newton's rings experiment.　**[5M]**
　　　　　　　　　　　　　　　　OR
4 a) Distinguish between Fresnel and Fraunhofer diffraction?　**[4M]**
   b) Explain Resolving power of grating.　**[5M]**
   c) What is diffraction grating? Explain the formation of spectra by diffraction
      grating?　**[5M]**
SECTION-III
5 a) Define density of energy states.　**[3M]**
   b) Explain the Bloch's theorem　**[5M]**
   c) Explain the concept of effective mass of an electron moving in a one-
      dimensional periodic potential.　**[6M]**
　　　　　　　　　　　　　　　　OR
6 a) Discuss the Kronig - Penny model for the motion of an electron in a periodic
      potential?　**[10M]**
   b) Distinguish between metals, semiconductors and insulators?　**[4M]**
SECTION-IV
7 a) What notes on polarization mechanism　**[3M]**
   b) What is local field in a dielectric material? Derive an expression for it by
      Lorentz method.　**[7M]**
   c) Derive Clausius- Mosotti equation for solids?　**[4M]**
　　　　　　　　　　　　　　　　OR
8 a) Derive an expression for Bohr Magneton?　**[7M]**
   b) Explain the different types of magnetic materials.　**[7M]**

SECTION-V

9   a)   What are the characteristics of lasers   **[4M]**

       b)   What are the different types of pumping methods? Explain   **[4M]**

       c)   Explain with a neat sketch the construction and working of Ruby laser   **[6M]**

OR

10   a)   Distinguish between spontaneous emission & stimulation emission   **[5M]**

       b)   Derive Einstein coefficients and derive the relation between them.   **[9M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Advance Supplementary Examinations, June 2019
Mathematics-II
(Common to all branches)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1 (a). Find a root of $e^x \sin x = 1,$ using regula falsi method. **[8M]**

(b).Find the real root of the equation $x\,e^x - \cos x = 0$ using Newton Raphson method. **[6M]**

OR

2 (a). Find y(54), given that y(50)=205, y(60)=225, y(70)=248, y(80)=274. Using Newton's forward difference formula. **[8M]**

(b). Using Lagrange's interpolation formula , y(10) from the following table **[6M]**

x	5	6	9	11
y	12	13	14	16

SECTION-II

3 (a). Evaluate $\int\limits_0^\pi \sin x\, dx,$ by dividing the range into 10 equal parts using **[8M]**

   (i) Trapezoidal rule   (ii) Simpsons 1/3 rd rule.

(b). Using Euler's method, solve for y at x=2 from $\dfrac{dy}{dx} = 3x^2 + 1,\ y(1) = 2,$ taking step size h=0.5. **[6M]**

OR

4 (a). Apply 4th order R.K method , to find an approximate value of y when x=1.2, insteps of 0.1, given that $y^1 = x^2 + y^2,\ y(1) = 1.5.$ **[8M]**

(b). Fit a polynomial of second degree to the data points given in the following table **[6M]**

x	0	1	2
y	1	6	17

SECTION-III

5 (a) State and Prove the relation between Beta and Gamma function. **[9M]**

(b). Show that $\int\limits_0^\infty \sqrt{x}\; e^{-x^3}\; dx = \dfrac{\sqrt{\Pi}}{3}.$ **[5M]**

6

(a). Show that $\int\limits_{a}^{b}(x-a)^{m}\ (b-x)^{n}\ dx = (b-a)^{m+n-1}\ B(m,n)$. **[8M]**

(b). Show that $\Gamma(1/2) = \sqrt{\pi}$. **[6M]**

SECTION-IV

7

(a). Evaluate $\iint\limits_{R} ydxdy$ where R is the region bounded by the parabolas $y^2 = 4x$ **[8M]**

and $x^2 = 4y$.

(b). Evaluate $\iint r\sin\theta\ dr\ d\theta$ over the cardiod $r = a\ (1-\cos\theta)$ above the initial **[6M]**
line.

OR

8

(a). Change the order of integration in $\int\limits_{0}^{1}\int\limits_{x^2}^{2-x} xy\ dx\ dy$ and hence evaluate the double **[9M]**

integral.

(b). Evaluate $\int\limits_{1}^{e}\int\limits_{1}^{\log y}\int\limits_{1}^{e^x}\log z\ dz\ dx\ dy$. **[5M]**

SECTION-V

9

(a). Find the directional derivative of $\phi(x,y,z) = x^2 yz + 4xz^2$ at the point (1,-2,-1) **[9M]**
in the direction of the normal to the surface $f(x,y,z) = x\log z - y^2$ at (-1,2,1)

(b). Find the work done in moving a particle in the force field $\bar{F} = 3x^2 i + j + zk$ **[5M]**
along the straight line from (0,0,0) to (2,1,3).

OR

10

Verify divergence theorem for $\bar{F} = x^2 i + y^2 j + z^2 k$ over the surface **S** of the filed **[14M]**
cut off by the plane $x + y + z = a$ in the first octant.

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
I B.Tech II Semester Advance Supplementary Examinations, June 2019
Object Oriented Programming
(Common to all branches)

Roll No										

Time: 3 hours   **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1 a Discuss the differences between object oriented programming and procedure oriented programming. **[7M]**

b Write a short note on benefits of OOP. **[7M]**

OR

2 a Analyze control structures & loops in object oriented programming. **[7M]**

b Describe encapsulation, inheritance and Polymorphism. **[7M]**

SECTION-II

3 a Explain about class and object with suitable program. **[7M]**

b Explain friend function with an example.. **[7M]**

OR

4 a Describe about objects as function arguments and scope resolution operator. **[7M]**

b Explain Inline functions and arrays of objects with example. **[7M]**

SECTION-III

5 a Define copy constructor and explain it with suitable program. **[7M]**

b Define single inheritance and explain with a suitable program **[7M]**

OR

6 a Describe default constructors and parameterized constructors with the help of program. **[7M]**

b What is multiple inheritances and describe it with suitable program. **[7M]**

SECTION-IV

7 a Analyze new operator and delete operator with appropriate example. **[7M]**

b Define operator overloading and describe it with suitable program. **[7M]**

OR

8 a Interpret virtual functions with suitable program. **[7M]**

b What is function overloading and explain it with a program. **[7M]**

SECTION-V

9 a Discuss class templates with suitable program. **[7M]**

b Write a short note on rethrowing an exception with an illustration. **[7M]**

OR

10 a Describe function templates with multiple parameters with suitable example. **[7M]**

b Explain types of exceptions and exception handing mechanism. **[7M]**

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