MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Engineering Mathematics**

Branch: **Common to CE, EEE, ME, ECE, CSE & MINING**

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. Find the rank of the matrix $A = \begin{bmatrix} 2 & 3 & 7 \\ 3 & -2 & 4 \\ 1 & -3 & -1 \end{bmatrix}$ by reducing it to the normal form

2. State Cayley – Hamilton Theorem

3. The integrating factor of $\dfrac{dy}{dx} + \dfrac{y}{x \log x} = \dfrac{\sin 2x}{\log x}$

4. Solve $(D^2 + 6D + 9)y = 2e^{-3x}$.

5. Find $L\{\sin^2 4t\}$

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. a) Solve the system of equations x+y+2z=4, 2x-y+3z=9, 3x-y-z=2.
   b) Reduce the following matrix into its normal form and hence find its rank.
   $$A = \begin{bmatrix} 8 & 1 & 3 & 6 \\ 0 & 3 & 2 & 2 \\ -8 & -1 & -3 & 4 \end{bmatrix}$$

2. Verify cayley – Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$ and find A^{-1}.

3. a) Solve $(x + y + 1)\dfrac{dy}{dx} = 1$
   b) Solve $y\dfrac{dy}{dx} + \dfrac{y^2}{x} = y$

4. Solve $(2x - 1)^2 \dfrac{d^2y}{dx^2} + (2x - 1)\dfrac{dy}{dx} - 2y = 8x^2 - 2x + 3$

5. a) Find $L\{\cos^2 2t\}$
   b) Find the inverse Laplace transform of $\dfrac{e^{-\pi s}}{s^2 + 1}$

6. Test for consistency and solve 5x+3y+7z = 4, 3x+26y+2z =9, 7x+2y+10z = 5.

7. Given $A = \begin{pmatrix} 2 & 1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{pmatrix}$ find A^{-1} and A^4 using Cayley – Hamilton theorem

8. a) Solve $y(x^2 y^2 + 2)dx + x(2 - 2x^2 y^2)dy = 0$.
   b) Show that the system of confocal conics $\dfrac{x^2}{a^2 + \lambda} + \dfrac{y^2}{b^2 + \lambda} = 1$ is self orthogonal.
   where λ is a Parameter.

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I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Applied Physics-I**

Branch: **Common to CE, ME, MINING, EEE, ECE & CSE**

Time: **3 hours**   Max. Marks: 60

PART – A

Answer ALL questions of the following   5x2Mark=10 Marks

1. For a thin film, give constructive and destructive interference conditions?
2. Write two differences between spontaneous and stimulated emission
3. Write merits and limitations of Magnetostriction method
4. Distinguish between free and forced vibrations.
5. State Bose-Einstein distribution law. Give its mathematical expression.

PART-B

Answer any **FIVE** Questions of the following   5x10 Marks= 50Marks

1. a) Discuss Fresnel's diffraction in brief.

   b) Explain Young's experiment demonstrating interference of light?

2. a) Explain four level pumping schemes.

   b) State and explain applications of optical fibers.

3. a) Write about Kundt's tube method

   b) Explain the Properties of ultrasonic waves

4. Deduce the differential equation and its solution for Damped vibrations.

5. Derive the expression for Planck's energy density for Black body radiation. Deduce Wien's displacement law and the Rayleigh – Jeans law from this expression.

6. a) Define i) Interference ii) Diffraction iii) Fringe width iv) Path difference v) Coherence

   b) Derive cosine law in thin film interference.

7. a) Write about acceptance angle and Numerical aperture. Derive the expressions for Acceptance angle and Numerical aperture.

   b) A signal of 100 mW is injected into a fiber. The out coming signal from the other end is 40 mW. What is the loss in dB?   (7+3)

8. a) What are the essential features required for acoustically good halls?

   b) Discuss how ultrasonics can be used for welding and drilling purposes.

Code No.: 50501

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I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Computer Programming**

Branch: **Common to CE, ME, MINING & CSE**

Time: **3 hours**   Max. Marks: 60

PART – A

I. Answer ALL questions of the following   5x2Mark=10 Marks

1. What is the use of ternary operator?
2. Differentiate Break and Continue statements?
3. What is Recursion in C Language?
4. Differentiate Structure and Union?
5. What are the different modes of file operations?

PART-B

Answer any **FIVE** Questions of the following   5x10 Marks= 50Marks

1. a) Write a C program that illustrates the application of logical Operators in C language.
   b) Draw the flow chart for finding greatest of 3 numbers.
2. a) Write a c program to find the GCD of two numbers.
   b) Write a C program to check whether a number is a power of 2 or not.
3. a) Explain any five standard Functions in C with suitable examples.
   b) Write a program to perform addition of two numbers using Functions with arguments and no return values.
4. a) Write the definition, declaration and initializations of Structures and Unions.
   b) Explain the use of following pre-processor directives
        i) Include   ii)define
5. a) Write a C program to read a text file and to count number of characters, words and lines.
   b) Explain Command line arguments.
6. a) List out the differences between entry controlled and exit controlled loops.
   b) Explain Conditional Compilation with examples.
7. a) Write a C program that checks whether an entered String is a Palindrome or not.
   b) Explain in detail Storage Classes with examples.
8. a) Write notes on formatted input and output functions?
   b) Write a program to check the given number is Armstrong or not and also draw the flowchart

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I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: <u>**Computer Programming And Numerical Methods**</u>

Branch: **Common to EEE & ECE**

Time: **3 hours**   Max. Marks: **60**

PART – A

I. Answer ALL questions of the following   **5x2Mark=10 Marks**

1. What is the use of ternary operator?
2. Differentiate Break and Continue statements?
3. What is Recursion in C Language?
4. Differentiate Structure and Union?
5. Find two iterations of $x^4 + 7x - 10 = 0$ using bisection method.

PART-B

Answer any **FIVE** Questions of the following   **5x10 Marks= 50Marks**

1. a) Write a C program that illustrates the application of logical Operators in C language.

   b) Draw the flow chart for finding greatest of 3 numbers.

2. a) Write a c program to find the GCD of two numbers.

   b) Write a C program to check whether a number is a power of 2 or not.

3. a) Explain any five standard Functions in C with suitable examples.

   b) Write a program to perform addition of two numbers using Functions with arguments and no return values.

4. a) Write the definition, declaration and initializations of Structures and Unions.

   b) Explain the use of following pre-processor directives

      i) Include   ii)define

5. Evaluate by using Simpson's 1/3 rule $\int_1^7 sinx^2 \, dx$ taking 7 ordinates.

6. a) List out the differences between entry controlled and exit controlled loops.

   b) Explain Conditional Compilation with examples.

7. a) Write a C program that checks whether an entered String is a Palindrome or not.

   b) Explain in detail Storage Classes with examples.

8. a) Write notes on formatted input and output functions?

   b) Write a program to check the given number is Armstrong or not and also draw the flowchart

Code No.: 50202

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I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Basic Electrical & Electronics Engineering**

Branch: CSE

Time: 3 hours   Max. Marks: 60

PART – A

Answer ALL questions of the following   5x2Mark=10 Marks

1. Write the statement of Superposition theorem
2. What is the impedance of series RLC circuit?
3. Write the constructional differences between core and shell type transformers.
4. How to turn on a MOSFET?
5. Write the truth table for NOR and NAND gates.

PART-B

Answer any **FIVE** Questions of the following   5x10 Marks= 50Marks

1. a) Draw and explain the Thevenin's equivalent circuit.

   b) State Ohm's law. Also mention its limitations.

2. a) Explain generation of a sinewave.

   b) Find the RMS value of sinusoidal waveform $v(t) = V_m \sin(wt)$

3. a) Explain speed torque characteristics of an induction motor?

   b) What is voltage regulation in an alternator?

4. a) Draw the V-I characteristics of PN-junction diode.

   b) Explain the operation of half-wave rectifier with neat sketch.

5. a) Explain about feedback amplifier.

   b) Explain the importance of binary number system.

6. a) State and explain Kirchhoff's law.

   b) Define real power, reactive power and apparent power in AC circuit.

7. a) Explain the principle of operation of an alternator.

   b) Explain the characteristics of enhancement and depletion mode MOSFETs.

8. **Write a short note on any TWO of the following**   2x5 Marks= 10Marks
   a) Explain about JK flip-flop
   b) Explain the principle of operation of 3-phase induction motor.
   c) Draw the phasor diagram of series RC circuit.

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I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Engineering Graphics**

Branch: CE MINING & ME

Time: 3 hours   **Max. Marks: 60**

Answer   **ALL** Questions of the following   **5x12 Marks= 60Marks**

1. A rectangular plot of land of area 0.45 hectare is represented on a map by a similar rectangular of 5sq.cm. Calculate the scale of the map. Also, construct a scale to read up to a single meter and long enough to measure 600meters. Mark on it, a distance of 375m.

OR

2. Draw a cycloid of a circle of diameter 50mm for one revolution. Also draw a tangent and a normal to the curve at a point 35mm above the base line.

3. The top view of a 75mm long line AB measures 50mm. A is 50mm in front of VP and 15mm below the HP. B is 15mm in front of the VP and is the above the HP. Draw the front view of AB and its inclinations with the HP and the VP.

OR

4. A line AB 90mm is inclined at 30^0 to the H.P. its end A is 12mm above the H.P. and 20mm in front of   V.P. its front view measures 65mm draw top view of AB and determine its inclination with the V.P.

5. Draw the projections of a regular hexagon of 25mm side having one of its sides in the H.P. and inclined at 60° to the V.P. and its surface making an angle of 45° with the H.P.

OR

6. A hexagonal pyramid of base side 30 mm and axis 60 mm has an edge of its base on the ground inclined at 45° to the V.P. and the axis is inclined at 30° to the H.P. Draw its projections.

7. A cone of base 50mm diameter and 60mm long, is resting on its base on H.P. Section plane perpendicular V.P, cuts the cone at a distance of 10 from the axis. Draw the development of the cut solid.

OR

8. A Cone of base 50 diameter and axis 60 long is resting on its base on H.P. It is cut by a section plane perpendicular to V.P and parallel to an extreme generator and passing through a point on the axis at a distance of 20 from the apex. Draw the development of the retained solid.

9. Draw the following orthographic views as shown in fig below. (All dimensions are in mm).
   a. Front view   b. Top view   c. Side view
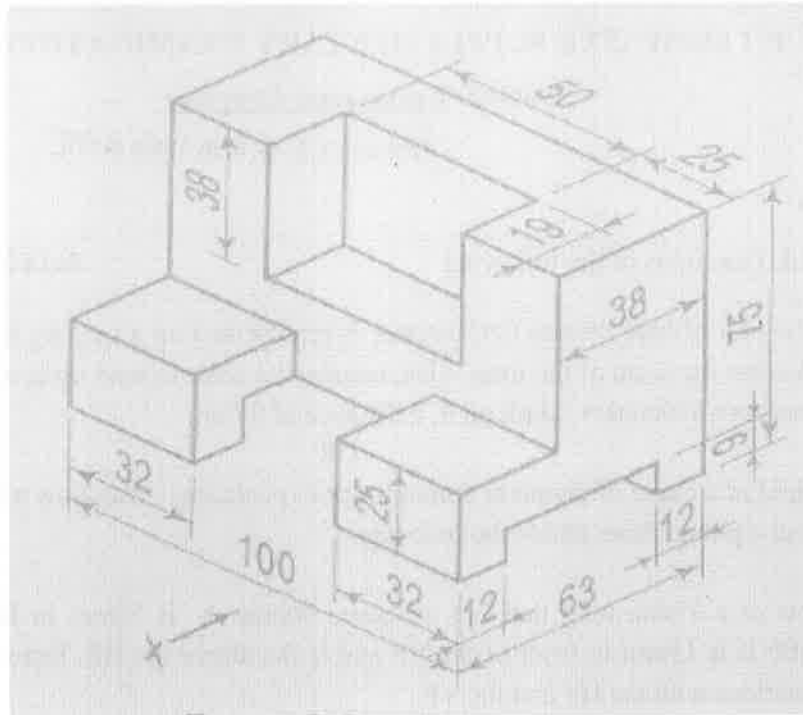
OR

10. Draw Front View, top view and side view for the part shown in Figure. All dimensions are in mm.
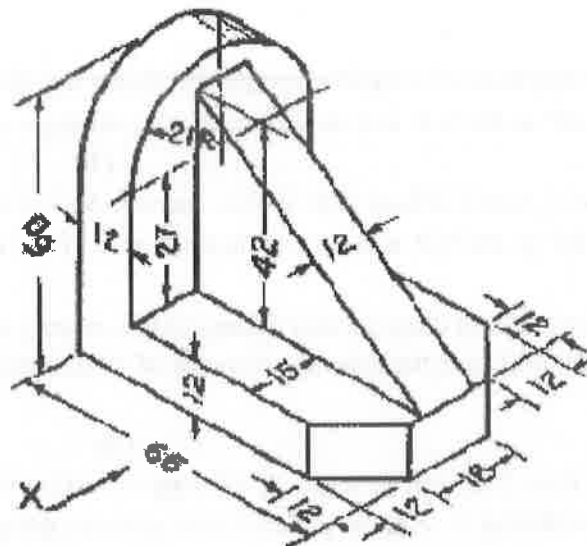
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I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Applied Chemistry**
Branch: **Common to CE, ME & MINING**

Time: **3 hours**   Max. Marks: 60

PART – A

Answer ALL questions of the following   **5x2Mark=10 Marks**

1. What are the specifications of drinking water?

2. What is cementation? Give examples.

3. Differentiate fibre, plastic and elastomer with examples.

4. What are the significant features of Biodiesel?

5. Write about bio Surfactants.

PART-B

Answer any FIVE Questions of the following   **5x10 Marks= 50Marks**

1. a) Explain the following treatment of boiler feed water with respect to

    i) Internal treatment   ii) External treatment

   b) What are boiler troubles? Write an account on priming and foaming.

2. a) Write Nernst equation and give its applications

   b) Describe the factors effecting rate of corrosion by nature of metal and nature of environment

3. a) What are synthetic rubbers? Discuss the synthesis and applications of Buna-S and Butyl rubber

   b) What is polymerization? Explain the free radical mechanism.

4. a) What is LPG and CNG? Write its constituents and applications.

   b) Write the advantages and disadvantages of hydro power and biomass energy.

5. a) Give a brief account of Principles of Green Chemistry

   b) Explain the role of ultrasonic and microwave assisted reactions in green synthesis.

6. a) Explain the chlorination and ozonisation methods of disinfection of water.

   b) Give an account on desalination of water by Reverse osmosis.

7. a) Explain compression moulding with a neat diagram.

   b) What are conducting polymers? Write its classification and applications.

8. Explain briefly the determination of calorific value by Junkers gas calorimeter with a neat labeled diagram

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I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: <u>English</u>
Branch: CSE

Time: 3 hours   Max. Marks: 60

PART – A

Answer ALL questions of the following   5x2Mark=10 Marks

1. a. **Fill in the following blank with suitable verb form given in the bracket.**
       She _____ (sleep) for the past three hours.
    b. **Fill in the following blank with suitable verb form given in the bracket.**
       Ravi _____ (live) in Mumbai since 2013.
2. a. **Fill in the blank with suitable word from the bracket.**
       To ordinary people mountaineering need not be a fearful journey/ voyage.
    b. **Transfer the following sentence into indirect speech.**
       he said to me, "Shall I return these notes by Monday?"
3. a. **Supply a question tag to the following.**
       You've been told about the meeting, _____?
    b. **Use the following phrasal verb in your own sentence.**
       "iron out"
4. a. **Find an adjective of the following word.**
       Conclusion
    b. **Find an adjective of the following word.**
       Ambition
5. **Join these two sentences**
       I returned the book. I read the book

PART-B

Answer any FIVE Questions of the following   5x10 Marks= 50Marks

1. a."You have a strange way, Ralph, of proving that the world has grown smaller." Explain
       the dialogue in the light of the passage, *It's a Small World.*
    b. Elucidate the principles of unity mentioned by Ambedkar for preserving our
       democracy.
2. a. Describe Satyajit Ray's character based on Roberge's comments.
    b. Summarize Kalam's speech.
3. a. Develop a paragraph on: 'Pedal power as the future of electricity generation.'
    b. Write an essay in approximately 300 words on "Start-Up India, Stand-Up India".
4. a. Write a **letter** to your friend (using the given words below) about 'Shuttler PV Sindhu
       who has won hat-trick of women's singles title in Macau Open Grand Prix Gold-2015.
       Awards - **Padma Shri (2015); FICCI Breakthrough Sportsperson** of the
       Year(2014); **NDTV Indian** of the Year (2014)- 1995 born- Pusarla Venkata Sindhu -
       Indian badminton player-women's singles title- a dominating game- against sixth seed
       Japan's Minatsu Mitani- lead 21-9, 21-23, 21-14- a fairy tale ending
    b. What is the role of technological ombudsman?

5. **a.** What role do the media play in reporting disasters? Explain with examples.

   b . Read the following passage and answer the questions that follow:

   Though modern forensics has a wide range of uses, its best known and the most common use is investigating criminal cases. The medical examiner is the central figure in the forensic investigation of crimes. He has to provide evidence, which will stand scrutiny of law, to link a suspect with a crime scene, victim or incident. Medical examiners are usually physicians specializing in forensic pathology. They are often called upon to perform autopsies in cases of suspicious deaths. They also have to examine and analyse the crime scenes and all evidences connected with the cases. Wherever necessary, medical examiners may obtain the services of other forensic scientists who are specialists in toxicology, psychology, entomology, etc.

       1) What is the primary function of modern forensics?
       2) What is the role played by medical examiners?
       3) Provide the antonym for the word, 'often''
       4) Who are medical examiners?
       5) Supply the synonym for the word 'investigate'

6. Dr. B.R Ambedkar, a staunch crusader for the rights of the down-trodden and backward sections of our society. Explain the spirit of his message in Grammar of Anarchy.

7. **a.** Media tunes the mindset of people- Explain.

   b. APJ Abdul Kalam is a role model to the engineers. Write short notes on any two qualities which according to you are most important for professional success.

8. Write an essay in approximately 300 words on "Memory cards have replaced human beings memory".

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I B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Electrical Circuits**

Branch: ECE

Time: **3 hours**   Max. Marks: 60

PART – A

I. Answer ALL questions of the following   **5x2Mark=10 Marks**

1. Three Resistances of 30Ω, 40Ω, 60Ω are connected in star find equivalent delta connected resistances?
2. What is meant by duality and what are the dual components for resistor, inductor, and capacitor?
3. Define magnetic circuit.
4. Explain the impedance triangle.
5. Calculate the resonance frequency when $R=1K\Omega$, $L=100mH$ and $C=0.1uF$

PART-B

Answer any **FIVE** Questions of the following   **5x10 Marks= 50Marks**

1. a) A battery consists of five cells, each having an emf of 1.2V and internal resistance of 0.4Ω joined in series. If battery is connected to 6Ω load then find the load current.
   b) State and explain Kirchhoff's Laws.

2. a) Explain the following terms with respect to graph theory
      i) Node (ii) Tree (iii) Link (iv) Directed Graph
   b) Find the branch currents as shown in Fig.by using the concept of Tie-Set Matrix.
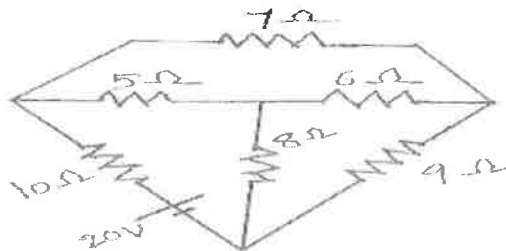
3. a) Calculate the value of mutual inductance if coefficient of coupling is 0.2 if $L_1=0.2H$, $L_2=2.2H$.
   b) Two coils with inductances in the ratio of 5:1 have a coupling coefficient k = 0.5. When these coils are connected in series aiding, the equivalent inductance is 44.4 mH. Find inductances L1, L2 and M.

4. A current of 4 A flows through a non-inductive resistance in series, with a choking coil when supplied at 230 V, 50 Hz. If the voltage across the resistance is 100 V and across the coil is 180V, draw the phasor diagram and calculate i) impedance, reactance and resistance of the coil ii) the power absorbed by the coil iii) the total power.

5. a) Compare series and parallel resonant circuits.
   b) Define Resonance?Explain about series resonance and quality factor?

6. a) Explain the differences between Practical sources and Ideal sources.
   b) Write short notes on star to Delta Transformation.

7. Calculate the mesh currents in the network shown
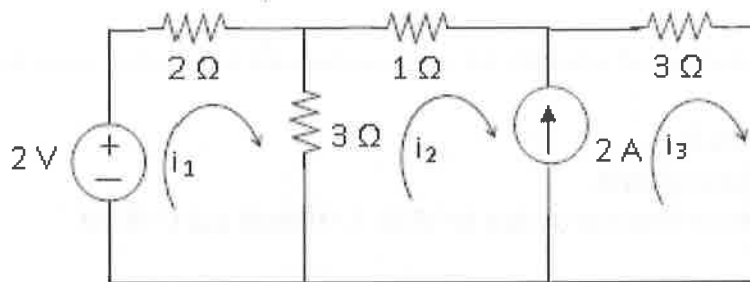
8. Two coils A and B having 50 and 500 turns respectively are wound side by side on a closed iron circuit of cross sectional area 120 Sq cm and mean length 240 cm. Find the mutual inductance between the two coils if the relative permeability of iron core is 800. If current in coil A grow from zero to 10 Amperes in 0.01 seconds, calculate the emf induced in coil B.