MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018
Subject: **Drilling and Blasting**

Branch: **MINING**

Time: 3 hours   Max. Marks: 75

PART – A

I. Answer ALL questions of the following   5x1Mark=5 Marks
1. What is the water loss in wire line drilling?
2. What is purpose of flushing in drilling?
3. What is a booster?
4. What is smooth blasting?
5. What is fly rock?

II. Answer ALL questions of the following   10x2Mark=20 Marks
1) What is directional drilling? Explain.
2) What is single tube core barrel? What are its limitations?
3) Explain the influence of torque in rotary drilling?
4) Explain the influence of air pressure in percussive drilling?
5) What is LOX? Explain briefly.
6) What is a RELAY? Explain briefly.
7) Name the drill pattern commonly used in underground coal mines. Draw a diagram for wedge cut pattern.
8) What is blown shot? Explain briefly.
9) What is the purpose of decking in blasting in open cast mines? Explain briefly.
10) What is trench cutting? Explain briefly.

PART-B
Answer ALL questions of the following   5x10 Marks= 50Marks
1) What is wire line drilling? Explain it in detail. what are it's advantages?

(OR)
2) What is the purpose of feed mechanism in diamond drilling? Explain hydraulic feed mechanism in detail.
3) Explain the influence of physico-mechanical properties of rocks on drillability in percussive drilling

(OR)
4) What is rotary- percussive drilling? Explain it's principles of operations, applicability, advantages and disadvantages.
5) What is ANFO? Explain it in detail. What are it's advantages and disadvantages?

(OR)
6) What is NONEL? Explain it in detail, giving its composition, applicability, advantages and disadvantages.
7) Explain the drill patterns commonly used in shaft sinking, with suitable figures.

(OR)
8) What is misfire and it's causes? Explain the procedure to deal with misfire in underground coal mines?
9) What do you understand by the term "Ground vibrations"? What are the factors influencing ground vibrations in blasting in open cast mines. Explain them.

(OR)
10) Blasting has to be done 20m away from existing gas pipe line in a refinery. Explain the procedure for such blasting? What precautions to be adapted during such blasting.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: **Mechanics of Solids**

Branch: **MINING**

Time: 3 hours   Max. Marks: 75

PART – A

I. Answer ALL questions of the following   5x1Mark=5 Marks

1. Define Stress and Strain.
2. What are the different types of loads acting on a beam?
3. State the bending equation and mention the units of the terms.
4. State the function of shaft.
5. What is redundant frame?

II. Answer ALL questions of the following   10x2Mark=20 Marks

1. List out the three elastic constants and write down the relation between them.
2. Define modulus of elasticity and bulk modulus.
3. Explain the different types of beams?
4. Draw the shear force and bending moment diagrams of cantilever beam of length L subjected to a point load W at the free end.
5. State any four assumption made in the theory of simple bending.
6. Define neutral layer and neutral axis.
7. Write an expression for maximum slope and deflection of cantilever beam with a point load to free end.
8. Explain theory of pure torsion.
9. Derive an expression for hoop stress of a thin cylindrical shell.
10. What is perfect frame and imperfect frame?

PART-B

Answer ALL questions of the following   5x10 Marks= 50Marks

1. A mild steel bar has a diameter of 10 mm and is 350 mm long. A tensile load of 15KN is applied longitudinally. Calculate the extension of the bar, change in diameter and change in volume. Assume E_s =2x10^5 N/mm^2 and the poisson's ratio is 0.25.

(OR)

2. A) Draw the Stress- Strain diagram for ductile material and explain the different point in it.
   B) A metal bar 200 mm long and cross-section area 25 mm^2 and carries an axial load of 5 KN which produce an extension of 0.2 mm. Find the stress in the bar and the modulus of elasticity of the metal.

3. A beam of length 1.2 m is simply supported at its ends and carries two points loads of 2.5 KN and 3 KN at distances of 0.4 m and 0.8 m from the left end support. Draw the SFD and BMD.

(OR)

4. Draw the SFD and BMD of cantilever beam of length 3 m subjected to uniformly distributed load of 5kN/m over the entire length of the beam and a point load of 10kN at a distance 1.5m from the free end.

5. A wooden beam has to carry masonry wall over a span of 5m. The wall is 300mm thick and 3m high. Design a suitable rectangular section of the beam depth being 1.5 times the width and maximum bending stress in the beam is not to exceed 7.5 N/mm². Masonry weights 20 kN/m³. Neglect the self weight of the beam.

(OR)

6. A beam of length 5 m has an inverted T-section with 100 x 20 mm flange and 100 x 20 mm web. It is simply supported at the ends and it carries a uniform distributed load of 2 kN/m. Calculate the maximum tensile and compressive stresses.

7. A cantilever of length 3 m carries u.d.l of 2kN/m over a length of 1.5m from fixed end and a point load 1kN at free end. If the section is 80mm x 120mm deep, calculate the slope and deflection at free end. Take $E = 2 \times 10^5$ N/mm².

(OR)

8. (A) Derive the torsion equation. **(6M)**
(B) A solid shaft of diameter 10 mm is subjected to a torque of 18 Nm. Find   the angle of twist over a length of 250 mm. Take $G = 0.8 \times 10^5$ N/mm². **(4M)**

9. A cylindrical shall 2.5 m long, 1 m in diameter and metal thickness 10 mm is subjected to an internal pressure of 1.2 N/mm². Calculate the maximum intensity of shear stress induced and also the change in the dimensions of the shell.

(OR)

10 Find the forces acting in all members of trusses shown in below fig.
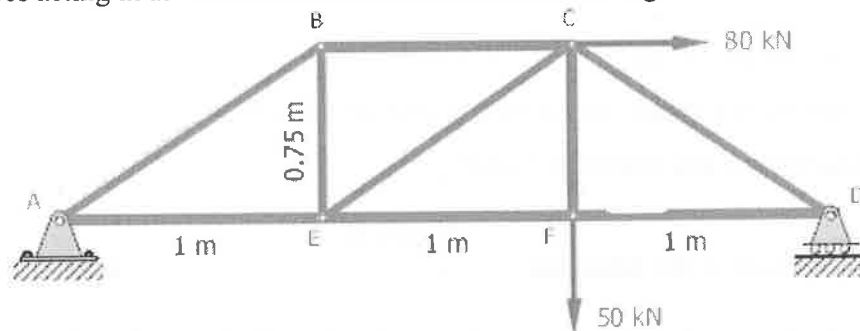
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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: **Basic Electrical And Electronics Engineering**

Branch: **Common to CE & MINING**

Time: **3 hours**   Max. Marks: 75

PART – A

I. Answer ALL questions of the following   5x1Mark=5 Marks
1. What is the Efficiency of the Maximum Power transfer theorem?
2. Define a Transformer.
3. Define armature winding?
4. What is the Rectifier?
5. Write the equation for the Deflection Sensitivity of the CRT?

**II. Answer ALL questions of the following**   10x2Mark=20 Marks
1. The current in a 2 Henry inductor varies at a rate of 2A/sec. Find the voltage across the inductor and the energy stored in the magnetic field at 2A.
2. Two resistors of 4 Ω and 6 Ω are connected in parallel. If the total current is 30A, find the current through each resistor
3. A transformer has a 1:6 turns ratio and a secondary coil load resistance of 470 Ω. The load resistance as seen by the source is _____ .
4. Write down the relationship between MMF and flux.
5. Write the condition for the Maximum power in the DC Motor?
6. Explain the motor principle
7. Write principle of operation of the Half Wave Rectifier?
8. Define zener breakdown.
9. What are the major parts of the CRT?
10. Write the equation for Deflection for a CRT.

PART-B

Answer ALL questions of the following   5x10 Marks= 50Marks
1. Find the Thevenin equivalent (V_{TH} and R_{TH}) between terminals A and B of the circuit given.
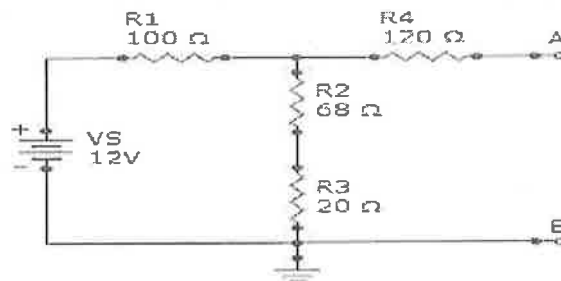
OR

2. State and prove maximum power transfer theorem.

3. In a 25-KVA, 2000/200V, single phase transformer, the iron and full-load copper losses are 350 and 400W respectively. Calculate the efficiency at unity power factor on (i) full load (ii)half-full load.

OR

4. a) Write and explain the condition for maximum efficiency of a transformer.

   b) A single phase 2200/50V, 50Hz transformer has a net core area of 36 cm^2 and a maximum flux density of 6Wb/m^2. Calculate the number of turns of primary and secondary

5. Explain the principle of operation of a.c generator?

OR

6. Classify the different types of DC motors and derive the torque expression for DC motor

7. a) Explain the effect of temperature on Volt-Ampere characteristics of a diode?

   b) Give a Schematic diagram of SCR and explain its characteristics and applications.

OR

8. A half wave rectifier, having a resistive load of 1000Ω and alternating voltage of 325V peak value and diode has a forward resistance of 100Ω. Calculate a) Peak, average and RMS value of current. b) DC power output. c) AC input power d) Efficiency of rectifier.

9. Explain the working of RC-Phase shift oscillators with transistor.

OR

10. a) Write down the application of oscillations?   [3+7]

    b) Write down the advantages of RC-phase shift oscillator with transistor

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2018

Subject: **MATHEMATICS –III**

Branch: **Common to ME & MINING**

Time: **3 hours**   Max. Marks: 75

PART – A

I. Answer ALL questions of the following   5x1Mark=5 Marks

1. Write the fourier sine transform.

2. State Damping Rule.

3. Write the Newton's Backward difference formulae for the first and second order derivatives.

4. Write down Milne's Corrector formula.

5. Write down general linear partial differential equation of the second order in two independent variables.

II. Answer ALL questions of the following   10x2Mark=20 Marks

1. Find half range cosine series of $f(x) = x$ in $0 \leq x \leq \pi$.

2. Express $f(x) = x$ as Fourier series in $(-\pi,\pi)$

3. Find Z-Transform of unit step sequence (Hn) where $H_n = \begin{cases} 1 \ for \ n \geq 0 \\ 0 \ for \ n < 0 \end{cases}$

4. Show that $Z(\frac{1}{n!}) = e^{\frac{1}{x}}$

5. If $\sum x = 72$, $\sum y = 36$, $\sum xy = 282$, $\sum x^2 = 588$, n=9 and y=a+bx then find a and b

6. Find a least squares straight line for the following data.

x	1	2	3
y	5	3	6

7. Given $\frac{dy}{dx}=x+y$, $y(0) = 1$, find the value of y(0.1),y(0.2) by Euler's method.

8. Obtain Picard's second approximate solution of the initial value problem $\frac{dy}{dx} = \frac{x^2}{y^2+1}$, $y(0) = 0$.

9. Form the partial differential equation by eliminating the arbitrary constants a,b from $Z = ax^3 + by^3$

10. Solve $\sqrt{p} + \sqrt{q} = 1$.

Answer ALL questions of the following   **5x10 Marks= 50Marks**

1. Obtain the Fourier cosine series of $f(x) = x \sin x$ in $(0, \pi)$ and show that $\frac{1}{1.3} - \frac{1}{3.5} + \frac{1}{5.7} - \frac{1}{7.9} + \cdots = \frac{\pi - 2}{4}$

OR

2. Obtain a half range cosine series for $f(x) = \begin{cases} kx, \ 0 \le x \le \frac{1}{2} \\ k(1-x), \frac{1}{2} \le x \le 1 \end{cases}$

3. Find the inverse Z-Transforms of $\frac{z}{(z+3)^2(z-2)}$

OR

4. Use Z-Transform solve the difference equation $u_{n+2} - 6u_{n+1} + 9u_n = 3^n$ with $y_0 = 0$, $y_1 = 1$.

5. Evaluate $\int_0^\pi \frac{\sin x}{x} dx$ by using i) Trapezoidal rule ii) Simpson's 1/3 rd rule by taking n=6

OR

6. Evaluate integral $\int_0^6 \frac{dx}{1+x^2}$ using Trapezoidal rule, Simpson's $1/3^{rd}$ rule and Simpson's $3/8^{th}$ rule using n=6.

7. Use Milne's Predictor - corrector method to obtain the solution of the equation $\frac{dy}{dx} = x - y^2$ at x=0.8 given that y(0)=0, y(0.2) = 0.02, y(0.4) = 0.0795, y(0.6) = 0.1762.

OR

8. Given $\frac{dy}{dx} = x^2(1+y)$ and y(1) =1, y(2) = 1.233, y(1.2) = 1.548, y(1.3) = 1.979 evaluate y(1.4) by Predictor-Corrector method.

9. Solve by the method of separation of variables $4u_x + u_y = 3u$ $u(0, y) = e^{-5y}$.

OR

10. Solve the equation $\frac{\partial^2 z}{\partial x^2} - 2\frac{\partial z}{\partial x} + \frac{\partial z}{\partial y} = 0$ by the method of separation of variables.