Code No.: **50B11**

MR15-2015-16 Batch

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **Operation Research**

Branch: **ME**

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

PART – A

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

1. Explain about Travelling salesman problem.
2. Which competitive situation is called a game
3. Explain arrival process in queuing model
4. Define Inventory control. How many types of costs are involved in inventory control.
5. Explain methods of solving dynamic programming problems

PART-B

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

1. Solve the following by simplex method adding artificial variables

   Max $Z=2X_1+5X_2+7X_3$

   Subject to $3X_1+2X_2+4X_3 \leq 100$

   $X_1+4X_2+2X_3 \leq 100$

   $X_1+X_2+3X_3 \leq 100$

   X_1, X_2, X_3

2. A company uses its maintenance crew in three teams for their preventive maintenance of their heavy vehicles. First team looks after the replacement of worn out parts, the second oiling and resetting and the third checking and tests running. Time estimates for these are given below. Find the sequence and schedule them so as to minimize the total elapsed time and idle time.

Vehicle No / Team	1	2	3	4	5	6	7
Replacement team	3	8	7	4	9	8	7
Resetting team	4	3	2	5	1	4	3
Inspection team	6	7	5	11	5	6	12

3. In a car wash station cars arrive for service accounting to Poisson distribution with mean 4/hr. The average service time of a car is 10min. Determine
   i) The probability that an arriving cars has to wait.
   ii) Find the average time of a car stays in a station.
   iii) If the parking space cannot hold more than six cars, Find the probability that the arriving car has to wait outside.
4. The annual demand for a product is 64000 units. The cost per order is Rs 10 and the estimated cost of carrying one unit stock for a year is 20%. The normal price of the product is Rs 10 per unit. However the supplier offers a quantity discount of 2% on order at least 1000 units at a time and a discount of 5% if the order is at least 5000 units. Suggest the most economical purchase quantity per order.

5. Records of 100 truck loads of finished jobs arriving in a department's checkout area show the following

   Checking out takes 8 minutes and checkers take care of only one truck at a time. The data is summarized in the following table.

Truck Inter Arrival time	1	2	3	4	5	6	7	8	9	10
Frequency	1	5	6	10	15	20	30	5	5	3

   As soon as the trucks are checked out, the truck drivers take them to the next departments. Using Monte Carlo simulation, determine

   a) What is the average waiting before service?

   b) What is likely to be the longest wait?

6. Alpha construction company has five crews. The skills of the crews differ from one another because of the difference in the composition of the crews. The company has five different projects on hand. The times (in days) taken by different crews to complete different projects are summarized in the following table. Find the best assignment of the crews to different projects such that the total time taken to complete all the projects is minimized.

		Project				
		A	B	C	D	E
Crew	1	20	30	25	15	35
	2	25	10	40	12	28
	3	15	18	22	32	24
	4	29	8	34	10	40
	5	35	23	17	26	45

7. The cost of a machine is Rs.6100 and its scrap value is only Rs.100. The maintenance costs are found from the experience is given in Table

Year	1	2	3	4	5	6	7	8
Maintenance cost (Rs.)	100	250	400	600	900	1250	1600	2000

   When should machine be replaced?

8. Write short notes on any **two** of the following

   (a) Lead time, Inventory cycle, Re-order cycle, Re-order period

   (b) Solve the game with a pay off matrix

$$\begin{array}{c} \\ A1 \\ A2 \\ A3 \end{array}\begin{array}{c} \begin{array}{cccc} B1 & B2 & B3 & B4 \end{array} \\ \begin{bmatrix} 1 & 7 & 3 & 4 \\ 5 & 6 & 4 & 5 \\ 7 & 2 & 0 & 3 \end{bmatrix} \end{array}$$

   (c) Discuss the different types of failures that occur on a machine

Code No.: **50342**

MR15-2015-16 Batch

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

IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **Renewable Energy Sources**

Branch: **ME**

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

PART – A

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

1. What do you mean by the term 'Extraterrestrial Radiation'?
2. Mention various applications of solar energy
3. List out the different Biomass resources.
4. What do you mean by the term 'Neap Tides'?
5. Write any three applications of Fuel cell.

PART-B

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

1. Explain with neat sketch working principle of Campbell-Stokes sunshine recorder.
2. a) Explain the working principle of a Concentrating Solar Collector with a neat diagram
   b) Explain Latent Heat Storage method for Solar Energy
3. Illustrate the various types of Horizontal Axis Wind Turbines (HAWT).
4. a) With neat sketch explain working of Double basin type tidal power plant.
   b) Derive an expression for estimation of energy and power produced by a single basin tidal system.
5. a) Explain Sebeck, Peltier effects.
   b) Write short notes on superconductivity and gas conductivity.
6. a) Describe briefly about 'Estimation of average solar radiation.'
   b) illustrate types of solar radiation data.
7. a) Explain solar distillation with neat sketch. What are the advantages and disadvantages?
   b) Draw and explain an equivalent circuit of a practical solar PV cell. (5M)
8. Write short notes on any two of the following
   (a) Stratified storage of solar energy.
   (b) Economics of Mini-hydel power plants.
   (c) KVIC digestors.

Code No.: **50343**

MR15-2015-16 Batch

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **Production Planning & Control**

Branch: **ME**

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

PART – A

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

1. What are the phases of production planning and control?
2. What are the different qualitative and quantitative methods of forecasting?
3. What is meant by inventory control?
4. Give the stepwise procedure in Routing?
5. Define Line of Balance? What are the various charts used in LOB?

PART-B

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

1. a) Explain the importance of PPC department in a typical production system.
   b) Explain different types of production systems and differentiate between them.
2. Using the exponential smoothing technique, Compute the forecasts from the following data (time series) under the situations when $\alpha = 0.7$.Compute the forecast for the 11^{th} period?

Month	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Demand	28	30	32	31	27	26	30	33	32	31

3. a) What are the basic ideas involved in EOQ concept? Discuss.
   b) Explain various benefits and demerits of JIT system.
4. a) Explain in detail about standard scheduling methods.
   b) What is JIT? How is useful in manufacturing Industry
5. a) Compare and discuss the functioning of centralized and decentralized dispatching in a Toy Manufacturing plant?
   b) Differentiate between Expediting and Follow up? Write down various types of expediting procedures?
6. "Plan your work and work according to your plan". Explain the meaning of slogan in the backdrop of PPC function.
7. a) Enumerate the factors involved in forecasting.
   b) What are the contents to be mentioned in a route sheet? Explain with an example.
8. Write short notes on any two of the following
   (a) Explain briefly about forward scheduling and backward scheduling.
   (b) Various steps of Line of Balance technique.
   (c) Explain about carrying cost and order cost.

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Code No. : 50344

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **ROBOTICS**

Branch: **ME**

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

PART – A

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

1. Explain the classes of automation
2. What are the three rotation matrices explain?
3. Differentiate between Lagrange Euler and Newton Euler Formulation.
4. Explain briefly about resolvers.
5. List the various applications of robot in non manufacturing system.

PART-B

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

1. a) List and explain the reasons for automation.
   b) What are future manufacturing applications of robot?
2. a) What are the characteristics of a Homogeneous transformation matrix?
   b) Find the rotation matrix for a rotation of 30 about the OZ axis, followed by a rotation of 60 about OX axis followed by a rotation of 90 about OY axis.
3. a) Discuss briefly the requirements of a robot programming languages?
   b) Explain straight line motion?
4. a) State and explain the working of resolvers and encoders.
   b) Compare stepper motor and DC servo motor for a robot
5. What are the various fields in which the robots used? Discuss them in detail.
6. a) Define Automation and explain flexible automation.
   b) Explain different end effectors.
7. Construct the DH matrix for a cylindrical robotic arm..
8. Write a short notes on the following
   a) Encoders
   b) Direct and Inverse kinematics
   c) Teach pendent programming

Code No.: **50337**

MR15-2015-16 Batch

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **CAD/CAM**

Branch: **ME**

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

PART – A

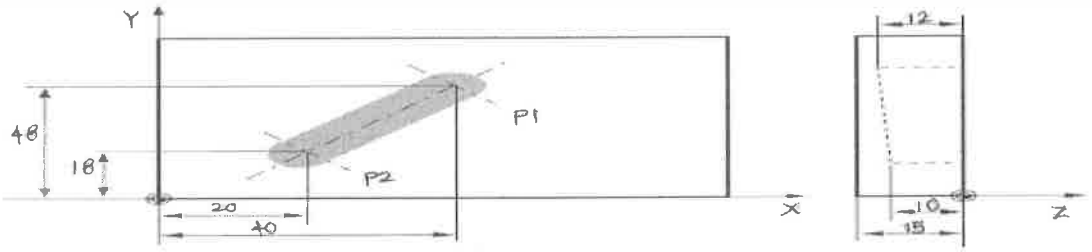
Answer ALL questions of the following **5x2Mark=10 Marks**

1. Define CAD
2. What is the need for geometric modeling?
3. What do you mean by an editing command "OFFSET"?
4. Define part-family
5. What is use of CIM in manufacturing?

PART-B

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

1. With a neat sketch, explain the principle of operation of Cathod-ray Tube Display Unit.
2. Explain the characteristics of 'Bezier' Cures that are used in CAD.
3. Write a CNC part program to produce the part shown in Fig. 1. Use the following information.
   - The tool traverses in rapid traverse on to P1, spindle speed = 500 rpm, clockwise
   - In-feed on Z-12, feed 100 mm/min
   - Tool travels on a straight line on to P2
   - Retraction in rapid traverse
   - End of program



4. a) Why coding system is important in group technology? How does that effect the efficiency of the system?
   b) How a FMS is different from GT?
5. a) Where non-contact inspection is necessary and how it is accomplished?
   b) Explain three material handling systems used in automated factory.
6. a) What is hidden surface removal and how it is accomplished?
   b) Explain the principle of DDA algorithm.
7. a) List and explain five properties of Bezier surface.
   b) Present a surface, which is simultaneously a surface of revolution and a ruled surface. Is your surface developable?
8. Write short notes on any two of the following
   (a) Explain different types of NC modes.
   (b) Elaborate the procedure for CNC part programming. (c) Networking in CIM

Code No.: **50B22**

MR15-2015-16 Batch

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **NDT and Vacuum Technology**

Branch: **ME**

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

PART – A

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

1. Mention any four types of defects.
2. What is the principle of Radiographic testing?
3. What is vacuum and mention different Vacuum ranges?
4. What are direct reading and indirect reading vacuum gauges? Give the examples for each.
5. What is the role of cold cap in diffusion pump?

PART-B

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

1. a) Discuss in detail Staining defect.
   b) What do you mean by NDT? Mention its advantages over destructive and partially destructive testing.
2. Explain in detail Liquid penetration method with necessary diagrams.
3. a) Distinguish Low level and Medium level vacuum. [6M+4M]
   b) Identify one process each, which require low, medium, high and ultra – high levels of vacuum
4. a) Explain how ion current is produced in Hot cathode gauge.
   b) Explain the drawback identified by Nottingham in the design of Hot cathode gauge
5. Explain in detail working mechanism of Diffusion pump with neat diagram.
6. a) Write a short note on honey combing, dusting and blistering.
   b) List any four objectives of non-destructive testing? [6M+4M]
7. Discuss Magnetic particle testing method with relevant sketches.
8. Write short notes on any two of the following.
   a. Discuss Freeze – thaw effect.
   b. What is the significance of Developer in Liquid penetration method?
   c. Write a note on Seebeck effect. How does it influence Thermocouple gauge.

Code No.: **50340**

MR15-2015-16 Batch

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

IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, DECEMBER-2018

Subject: **Unconventional Machining Processes**

Branch: **ME**

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

PART – A

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

1. State the need for unconventional machining process.
2. What is the principle behind abrasive jet machining?
3. What are the tool materials used in sink EDM.
4. Explain briefly how material is removed in EBM process
5. What the applications of shaped tube electrolytic machining?

PART-B

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

1. a) Explain various characteristics of Non-conventional machining Processes.
   b) Mention the salient features of Ultrasonic Machining. Explain theprinciple of USM with neat diagram.
2. a) Mention applications and limitations of Ultrasonic machining
   b) Discuss the classification of Unconventional Machining Processes.
3. a) What are the factors that affect the material removal rate in AJM process? What are the applications of AJM process?
   b) Explain the various process parameters that affect the surface finish of component machined using ECM process.
4. a) Explain the electrochemical deburring and honing processes in detail.
   b) Explain in detail the MRR, application and limitations of water jet machining.
5. a) Explain the working principle of EDM with neat sketch and list out its applications in various industries?
   b) What are the desirable properties of a dielectric fluid? Give some examples for dielectric fluids.
6. Differentiate between thermal and non-thermal machining processes.
7. a) List out the advantages and limitations of Plasma machining process.
   b) Explain the working principle of Abrasive flow machining.
8. Write short notes on any two of the following
   a) Explain the principle of water jet machining?
   b) Write about piezo electric effect in USM.
   c) Comment about the nature of spark eroded surfaces.

Code No.: **50341**

MR15-2015-16 Batch

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

IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, DECEMBER-2018

Subject: **MECHATRONICS**

Branch: **ME**

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

PART – A

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

1. What is the role of opto-isolator in robot control?
2. What do you understand by signal conditioning?
3. What are the characteristics of DC brushed motor?
4. How does assembly language programming differ from ladder logic programming?
5. What are optical incremental encoders?

PART-B

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

1. Explain in detail about PC based control methods.
2. a) Discuss in detail about trends in mechatronics.

b) CNC is a mechatronics system: Justify

3. a) Explain the pneumatic power supply system and discuss on rotary actuators?

   b) Explain ADC?
4. Explain in detail the inverting and non-inverting type amplifiers.
5. Suggest possible motors, D.C. or A.C., which can be considered for applicationswhere (a) cheap, constant torque operation is required, (b) high controlledspeeds are required, (c) low speeds are required, (d) maintenancerequirements have to be minimised. Justify your answer.
6. Explain use of internal relays and counters in PLC program.
7. Write short note on Laplace transform and its application in analyzing differential equation in a control system.
8. Write short notes on any two of the following

   a) Pulse width modulation

   b) Digital I/O

   c) Piezo electric sensors

Code No.: **50338**

MR15-2015-16 Batch

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

IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, DECEMBER-2018

Subject: **Metrology & Instrumentation**

Branch: **ME**

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

PART – A

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

1. Define the terms i) Tolerance ii) Allowance and iii) Limits
2. What are the types of optical flats?
3. Explain speed of response and Overshoot.
4. Write a brief note about on photo electric transducer?
5. What is the working principle of torsional dynamometer?

PART-B

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

1. Design a GO Plug gauge and NO-GO Ring gauge (dimension and sketch) to check a hole and shaft of assembly 33 H7/g6. Allow unilateral gauge tolerance of 10% with a wear allowance equal to half of the gauge tolerance. Given that $i = 0.45 (D)^{1/3}+0.001D$, fundamental deviation of "g" = $-5.5 D^{0.41}$, 33 mm falls in the diameter step of 30 mm and 50 mm, IT7=16i, IT6=10i.

2. a) How slip gauges are manufactured? [2]
   b) Define surface plate. Explain various types of surface plates. [4]
   c) Explain the working principle of autocollimator with an application. [4]

3. a) Explain the working principle of talysurf with neat diagram [4]
   b) Explain the working principle of mechanical comparator with neat diagram [4]
   c) What are the sources of errors in the instrumentation? [2]

4. a) Explain in brief the working principle of Inductive transducer
   b) Explain in brief the working principle of Resistance transducer

5. a) Explain the various types of control systems [6]
   b) Explain the working principle of temperature control systems [4]

6. a) Explain profile and position gauges.
   b) Bring out the salient features of British standard and ISO systems of limits and fits.

7. a) What are the necessary conditions for interference of light waves? Explain why monochromatic light is used for interferometry work and not the white light?
   b) Explain the working principle of any one of the interferometers with neat diagram?

8. Write short notes on any two of the following.
   a) Differentiate open loop and closed loop control systems.
   b) Explain different thermo electrical laws used in thermocouple? Explain construction of thermocouple and various thermocouples used?
   c) Differentiate between interchangeable assembly and selective assembly, with suitable examples

Code No.: **50332**

MR15-2015-16 Batch

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, DECEMBER-2018

Subject: **Power Plant Engineering (Readmitted students)**

Branch: **ME**

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

PART – A

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

1. List the types of coal available in India.
2. Write the advantages of open cycle gas turbine power plant
3. State the function of a dam. How are dams classified
4. What is nuclear fusion reaction?
5. What is load duration curve?

PART-B

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

1. Explain briefly coal storage and its handling in a thermal power plant
2. Explain fuel supply system of a diesel engine power plant with neat sketch.
3. Explain pumped storage system in hydro electric power plant.
4. a) Write about various methods to dispose radioactive waste. [5M]

   b) Write the merits and demerits of nuclear power plant. [5M]
5. A power station has a maximum demand of 80×10^3 kW and daily load curve is defined as follows:

Time (Hr)	0-6	6-8	8-12	12-14	14-18	18-22	22-24
Load (MW)	40	50	60	50	70	80	40

   Determine the load factor of power station
6. a) Explain the construction and working of Electro-static precipitator.

   b) With a neat sketch explain the working of over feed and under feed fuel beds.
7. a) Explain the construction of an IC Engine with neat sketch.

   b) Classify the Gas Turbine power plants in detail.
8. a) Explain briefly the layout showing the various components and operation of a Hydro Electric Power Plant

   b) Write short notes on Fuel cells also discuss the advantages and limitations.

Code No.: **50150**

MR15-2015-16 Batch

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **GREEN BUILDINGS**

Branch: **Common to ME & Mining**

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

PART – A

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

1. Write in briefly the various methods and tools for building assessments.
2. What is project management in green building process
3. How we can do water conservation in green buildings
4. What are the economic benefits of green or sustainable building and development?
5. Categorize the carbon accounting green building specifications

PART-B

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

1. (a) Explain the importance of high performance green buildings.
   (b) What are the sources of Green building materials?
2. a) Explain about Design and construction relationships in green building process?
   b) Write about BREEAM and CASBEE?
3. a) Best Practices for indoor environmental quality
   b) What are the parameters involved in constructing a green building?
4. a) compare between green building and high performance building technologies?
   b) write about economic issues of green buildings?
5. a) Why do green buildings cost more than traditional buildings?
   b) Write a case study on green building located in Hyderabad, CII, IGBC.
6. a) Explain briefly about eight green building principles?
   b) Write about impacts of building construction, operation and disposal?
7. a) Write down the advantages and disadvantages of green building construction
   b) Write about the importance of landscaping in green building?
8. a) explain in detail about Building hydrologic cycle strategies?
   b) what is the strategy behind selecting green building materials?

Code No.: **50H09**

MR15-2015-16 Batch

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **Business Communication**

Branch: **Common to ME & Mining**

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

PART – A

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

1. What is an effective Business Communication?
2. Discuss the Semantic barriers.
3. Differentiate "Inferring meaning" and "critical reading".
4. What are the strategies for writing the Body of a Letter?
5. Write a few good mannerisms of " E- mail etiquette"?

PART-B

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

1. How does communication play a crucial role in the progress of an organization? Explain.
2. a). Gestures are observed actions. Elucidate.

   b). How postures help you asses a person's confidence or diffidence?
3. Write a short note on Skimming, Scanning, Intensive and extensive reading skills.
4. a). Format of a formal letter.

   b). Prepare a letter to the editor of a news paper on "spreading garbage in and around your locality" with some solutions
5. List out the advantages & disadvantages of e-correspondence.
6. a) Explain with examples the weak and strong forms of English speech.

   b) Briefly explain the essential ingredients of good oral communication
7. Write an essay on positive and negative non-verbal clues.
8. Explain the different types of Reading Techniques.