Code No.: **50328**

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

III B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018

Subject: **Design of Machine Members - II**

Branch: **ME**

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

PART – A

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

1. Define bearing characteristic number and bearing modulus.
2. Classify the Lubricants used in bearings.
3. Classify the types of Rope drives? Explain any one.
4. Explain the following terms used in helical gears

   (a) Lead angle (b) normal pitch.
5. Explain which type of Screw threads is used for Power Screws.

PART-B

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

1. a) What are the journal bearings? Give a classification of these bearings with neat sketch. [5M]

   b)The load on the journal bearing is 150KN due to turbine shaft of 300mm diameter running at 1800rpm determine i):length of the bearing if bearing pressure is 1.6N/mm^2 ii)Amount of heat to be removed by the lubricant per minute if bearing temperature is 60^{0}c and viscosity is 0.02kg/ms and the bearing clearance is 0.25mm. [5M]
2. a) What stresses are induced in the crankshaft ? [5M]

   b) The following particulars refer to a 4 stroke diesel engine:

   Piston diameter = 150mm, stroke length = 180mm, length of the connecting rod = 4 times of length of crank, rated rpm = 1500, mass of reciprocating parts per cylinder = 2.25kg, speed = 1200 rpm, maximum explosion pressure = 5MPa, F.S = 6, yield strength in compression 350MPa. Determine sizes of gudgeon pin and crankpin considering bearing pressured of 15MPa and 10MPa. [5M]
3. Two pulleys, one 450 mm diameter and the other 200 mm diameter, on parallel shafts 1.95 m apart are connected by a crossed belt. Find the length of the belt required and the angle of contact between the belt and each pulley. What power can be transmitted by the belt when the larger pulley rotates at 200 rev/min, if the maximum permissible tension in the belt is 1 kN, and the coefficient of friction between the belt and pulley is 0.25? [10M]

4. A pair of spur gears a 20^0 pressure angle; consist of a 25 teeth pinion meshing with a 60 teeth gear. The module is 5mm.while the face width is 45mm.The pinion rotates at 500 rpm.The gears are made of steel and heat treated to a surface hardness of 220BHN.Assume that dynamic load is accounted by means of the velocity factor. The service factor of safety is 1.75 respectively.

   Calculate:

   i) Wear strength of gears ii)The static load that the gears

   iii) Rated power that can be transmitted by gears. [10M]

5. The mean diameter of the square threaded screw having pitch of 10 mm is 50 mm. A load of 20 KN is lifted through a distance of 170 mm. Find the work done in lifting the load and the efficiency of the screw, when

   i) The load rotates with the screw, and

   ii) The load rests on the loose head which does not rotate with the screw. The external and internal diameters of the bearing surface of the loose head are 60 mm and 10 mm respectively. The coefficient of friction for the screw and the bearing surface may be taken as 0.08. [10M]

6. a) Explain the materials used to manufacture the bearings. [5M]

   b) What is the difference between the centre and overhung crankshafts? [5M]

7. a) Explain the different types of belt drives [5M]

   b) Derive the Lewis Equation [5M]

8. **Answer any TWO Questions of the following** **2x5 Marks= 10Marks**

   a) What are screws? Explain it briefly.

   b) Explain the formative number of teeth.

   c) What is wedge film and squeeze film journal bearings.

Code No.: **50331**

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

III B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018

Subject: **Finite Element Methods**

Branch: **ME**

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

PART-A

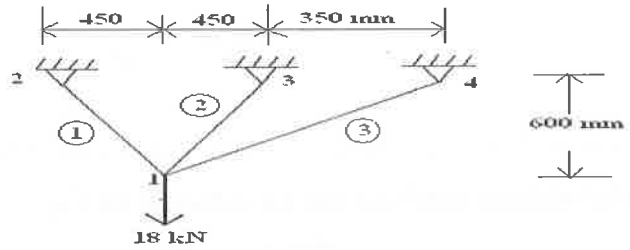
Answer ALL Questions of the following **5x2M=10M**

1. Describe Raleigh – Ritz method
2. State the principle of minimum potential energy.
3. Differentiate between truss element and beam element?
4. Differentiate between sub-parametric, iso-parametric and super parametric finite elements?
5. Write any two properties of Eigen vectors and Eigen values?

PART-B

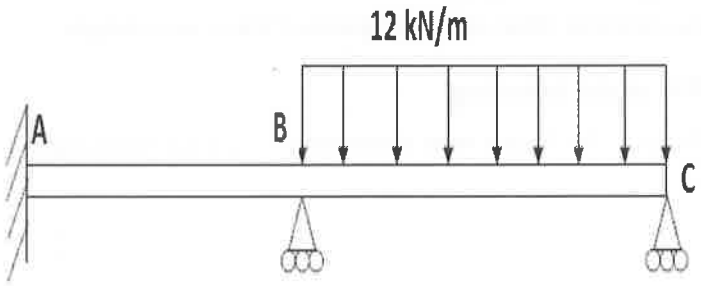
Answer any FIVE Questions of the following **5x10M=50M**

1. Discuss strain-displacement and stress-strain relations [10M]
2. For the truss element shown in figure, determine the displacement of node 1 and stress in element 3. Take A= 250 mm^2 and E= 200GPa. [10M]

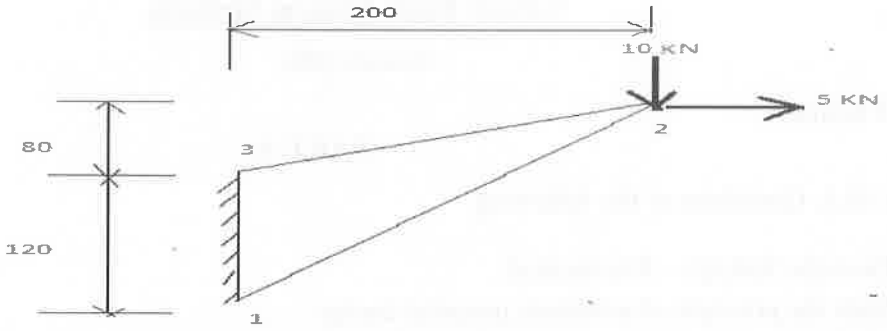


3. For the beam and loading shown in the Fig. Determine [10M]
   a. Deflection at the midpoint of BC
   b. Slope at B and C

   If AB = 1m, BC = 1m, E = 200 GPa and I = $4x10^6$ mm^4



4. For the triangular plate shown in figure, determine deflection at node 2 using a 1 element model. Also calculate the stress in the element. Given thickness of plate as 1 mm, take $E = 2 \times 10^5$ N/mm^2, $\upsilon = 0.3$. [10M]



5. For the stepped bar shown in the Fig.4 Develop the global stiffness and mass matrices and also determine the natural frequencies and mode shapes. Assume E = 200 GPa and mass density = 7850 kg/m^3, $L_1 = L_2 = 0.3$ m, $A_1 = 350$ mm^2, $A_2 = 600$ mm^2 [10M]

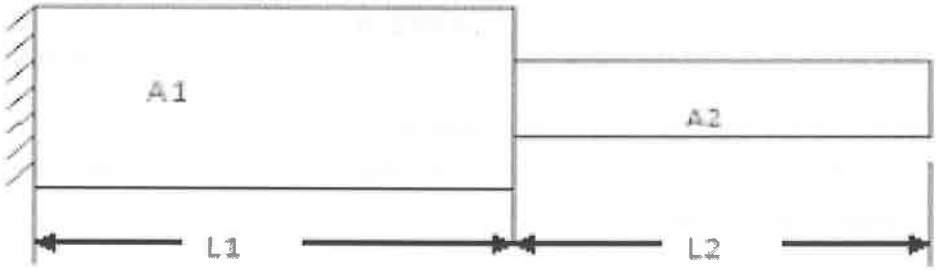
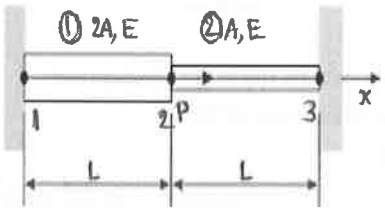


Fig.4

6. a) Write a short note on Formulate the stress strain relations for 2D and 3D elastic problems. [5M]
   b) Write the Global stiffness matrix for the bar shown in the Fig. [5M]



7. a) Briefly discuss about the types of beams. [5M]
   b) What is an Isoperimetric element, what are its properties? Give an example [5M]

8. **Write short notes on TWO of the following:** **2 x 5M= 10M**
   a) Equilibrium equations b) Space truss elements c) Jacobian matrix

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

III B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018

Subject: **CNC Technology**

Branch: **ME**

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

PART-A

Answer ALL Questions of the following **5x2M=10M**

1. Define Part Programming. What are the types of Part Programming?
2. What are the requirements of axes feed drives in CNC Machine tools?
3. Define CAD/CAM Software? What are its applications
4. Explain the benefits of Adaptive control machining processes?
5. What are the functions of Address Latch Enable (ALE) and Program Store Enable (PSEN) in 8051 microcontroller pins?

PART-B

Answer any FIVE Questions of the following **5x10M=50M**

1. A two- axis NC system used to control a machine tool table uses a bit storage capacity of 16 bits in its control memory for each axis. The range of the x-axis is 600mm and the range of the y-axis is 500mm. The mechanical accuracy of the machine table can be represented by a Normal distribution with standard deviation = 0.002mm for both axes .For each axis of the NC system, determine (a) the control resolution, (b) accuracy, and (c) repeatability. [10M]

2. a) What are the technical considerations that influence the functioning of Automatic Tool Changer (ATC)? [5M]
   b) List the different materials used in spindles and why AC spindles are selected in CNC machine tool? [5M]

3. a) Explain any 10 vocabulary words used in APT language? [5M]
   b) Explain automatic tool path generation in computer aided programming? [5M]

4. What is the difference between direct numerical control and distributed numerical control and explain them with block diagrams for each one. [10M]

5. a) Explain the selection of micro controllers in automobile applications? [5M]
   b) Explain the internal relays and counters in programming logic controllers? [5M]

6. a) Explain the design considerations of NC machine tool? [5M]
   b) Explain the structure of CNC machine tools. [5M]

7. a) Explain the use of following codes:
      i) G01, G04 ii) G71, G90 iii) G80, G81 iv) M02, M03 [5M]
   b) Explain adaptive control system for a machine tool with a block diagram. [5M]

8. **Write short notes on TWO of the following:** **2 x 5M= 10M**
   a) Parametric Programming b) Friction Guide Ways
   c) Operation of ACC System.

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

III B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018

Subject: **Refrigeration And Air Conditioning**

Branch: **ME**

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

PART-A

Answer ALL Questions of the following **5x2M=10M**

1. Explain need of refrigeration in air craft.
2. Explain superheat horn and throttling loss.
3. Compare vapour absorption and vapour compression refrigeration system.
4. Explain need for ventilation.
5. Sketch fixed air circuit heat pump.

PART-B

Answer any FIVE Questions of the following **5x10M=50M**

1. In a Bell-Coleman cycle, environment temperature is 320 K and refrigerant temperature is 120K. The minimum temperature of the cycle is 80 K. The pressure in the refrigerator is 1 bar. Find the following: i) Maximum temperature and pressure of the cycle ii) Refrigerating effect and heat rejected per kg of air iii) Net work required per kg of air iv) Compressor and expander swept volume per kg of air v) COP of the cycle. Assume the compression and expansion processes to be isentropic. [10M]
2. A simple ammonia-compression system operates with a capacity of 150 TR. The condensation temperature in the condenser is 35°C. The evaporation temperature in brine cooler is – 25°C. The ammonia leaves the evaporator and enters the compressor at – 8°C. Ammonia enters the expansion valve at 30°C. Wire drawing through the compressor valves: Suction = 0.118 bar; Discharge = 0.23 bar; Compression index = 1.22; Volumetric efficiency = 0.75.
   Calculate: (a) Power (b) Heat transferred to cylinder water jacket (c) Piston displacement (d) Heat transfer in condenser (e) COP. [10M]
3. Describe the working of Four Shell vapour absorption refrigeration system with schematic diagram and heat balance expressions. [10M]
4. Define the following psychrometric properties along with respective expressions: (a) Specific humidity (b) Degree of saturation (c) Relative humidity. [10M]

5. The following data refers to air conditioning of public hall:

   Outdoor conditions = 40°C DBT, 20°C WBT

   Required comfort conditions = 20°C DBT, 50% RH

   Seating capacity of hall =1000

   Amount of outdoor air supplied =0.3 m^3/min per person

   If the required condition is achieved first by adiabatic humidifying and then cooling, find:

   The capacity of the cooling coil and surface temperature of the coil if the by-pass factor is 0.25; andThe capacity of the humidifier and its efficiency [10M]

6. a) Explain the working principle of Reverse Carnot refrigerator and heat pump with schematic diagrams and obtain expressions for COP for both. [5M]

   (b) Explain about thermodynamic properties of refrigerants. [5M]

7. a) Write short notes on Actual VCRS [5M]

   b) Draw a neat diagram of three fluids or Electrolux refrigeration system? [5M]

8. **Write short notes on TWO of the following: 2 x 5M= 10M**

   a) Bell-Coleman Cycle b) Global warming c) Metabolism

Code No.: **50327** | **MR15-2015-16 Batch**

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

III B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018

Subject: **Thermal Engineering-II**

Branch: **ME**

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

PART-A

Answer ALL questions of the following **5 x 2 M=10 M**

1. What are the advantages of Superheating of Steam?
2. Write any four comparisons between fire tube and water tube boilers
3. Discuss the advantages of Jet Condensers
4. Explain the functions of the blading of a reaction turbine.
5. What are the important properties of good propellant.

PART-B

Answer any FIVE questions of the following **5 x 10 M=50 M**

1. a) The steam enters the turbine at 4MPa and 400° C. After expansion in the turbine to 400KPa, the steam is reheated to 400°C and then expanded in the low pressure turbine to 10KPa. Determine the reheat cycle efficiency. [5M]
   b) What are the different thermodynamic variables affecting efficiency and output of Rankine cycle. Explain their influence on Rankine cycle. [5M]
2. a) Explain the working of i) Water level indicator ii) Economiser. [5M]
   b) Estimate the height of the chimney to produce a static draught of 20 mm of water if themean temperature of the hot gases is 250°C and ambient temperature is 20°C. Assume thedensity of air and hot gases as 1.293 kg/m^3 and 1.34 kg/m^3 respectively at NTP. Alsoestimate the mass of flue gases formed per kg of fuel. Barometer reads 760 mm of Hg. [5M]
3. a) With a neat sketch explain the working of a high level Jet condenser. [5M]
   b) Dry saturated steam at a pressure of 8 bars absolute enters a convergent-divergentnozzle and leaves at 1.5 bars absolute. If the flow is isentropic and correspondingexpansion index is 1.135, find the ratio of cross-sectional area at exit and throat formaximum discharge. [5M]
4. a) Write a note on degree of reaction. Derive an expression for degree of reaction and show that inlet and outlet velocity triangles are symmetrical for a 50% degree of reaction turbine. [5M]
   b) What is compounding of turbines? Discuss in brief with relevant sketches. [5M]
5. a) Explain the working of a Turbojet Engine with the help of the schematic diagram and Thermodynamic Cycle. [5M]
   b) Air enters the compressor of a gas turbine plant operating on Brayton Cycle at 1 bar and 27°C. The presssure ratio in the cycle is 6. Calculate the maximum temperature in the Cycle and the cycle efficiency. Assume the turbine work as 2.5 times the compressor work. Take γ=1.4 [5M]
6. (a) Write a short note on concept of heat of reaction. [5M]
   (b) Explain the working of lever safety valve with a schematic diagram. [5M]
7. a) Explain the working of an Edwards Air Pump with a neat sketch. [5M]
   (b) Differentiate between Impulse and Reaction turbine. [5M]
8. **Write short notes on any TWO of the following** **2*5 =10M**
   a) Stoichimetric air b) Boiler horse power c) Surface condenser

Code No.: **50H14** | **MR15-2015-16 Batch**

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III B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018

Subject: **Industrial Management**

Branch: **ME**

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

PART-A

Answer ALL questions of the following **5 x 2 M=10 M**

1. What is scientific management?
2. What is team structure?
3. State the objectives of work measurement
4. What is meant by recruitment?
5. What is value chain analysis?

PART-B

Answer any FIVE questions of the following **5 x 10 M=50 M**

1. Explain the principles of management as outlined by Henri fayol. [10M]
2. Discuss different concepts of organization. Which type of organization would be most suitable for a manufacturing company? [10M]
3. Construct X and R charts from the following information and state whether the process is in control. For each of the following X has been computed from a sample of 5 units drawn at an interval of half an hour from an ongoing manufacturing process. [10M]

Sample	1	2	3	4	5	6	7	8	9	10
X	20	34	45	39	26	29	13	34	37	23
R	23	39	14	05	20	17	21	11	40	10

4. a) Explain the procedure of Grievance Handling in a industrial firm. 5M
   b) State the difference between PERT and CPM in project management. 5M
5. What do you understand by SWOT analysis? Discuss how it can be carried out for universities in general and a technological university in particular. [10M]
6. a) Explain Douglas McGregor's Theory X and Theory Y. 5M
   b) Discuss any two types of organization based on authority relationship. [5M]
7. a) Explain the methods of production 5M
   b) Explain the need for training in organizations. [5M]
8. **Answer Any TWO questions of the following** **2 x 5 M=10 M**

   Write short note on : a) Types of floats b) Planning and controlling c) Training and development

Code No.: **50332**

MR15-2015-16 Batch

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III B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018

Subject: **Power Plant Engineering**

Branch: **ME**

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

PART – A

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

1. What are the uses of ash?
2. What are the different parts of a gas turbine power plant?
3. What is hydrologic cycle?
4. State the advantages of fast breeder reactors?
5. What are the basic elements exhausted with a flue gases?

PART-B

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

1. With a neat sketch explain the different circuits of steam power plant. [10M]
2. With suitable sketches, explain the working of the combined steam turbine and gas turbine power plant [10M]
3. Explain the working principle of Thermo Electric power generation system with a neat sketch. [10M]
4. Discuss the various factors which must be considered while selecting a site for nuclear power plant. [10M]
5. Explain the following in detail: Capital cost, Investment of fixed charges and operating costs. [10M]
6. a) Write about various mechanical stokers. [5M]
   b) Explain the properties of lubricant used in diesel power plant. [5M]
7. a) Explain the working of thermo-ionic generator. [5M]
   b) Write short notes on what is nuclear breeding? [5M]
8. **Answer any TWO Questions of the following** **2X5M=10M**
   a) Explain the construction and working of Electro-static precipitator. [5M]
   b) Classify the Gas Turbine power plants in detail. [5M]
   c) Explain flat plate collector with neat sketch. [5M]

Code No.: **50H03** | **MR15-2015-16 Batch**

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III B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2018

Subject: **Technical Communication and Presentation Skills**

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

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

PART-A

Answer ALL Questions of the following **5x2M=10M**

1. Give meanings of the following words: i. Enterprise ii. Monitor
2. Prepare a memo to issue to your subordinate on his irregularity to office.
3. Differentiate between a 'summary' and an 'abstract.'
4. Explain the importance of oral presentation in professional life.
5. Write some important tips for note-making.

PART-B

Answer any **FIVE** Questions of the following **5x10M=50M**

1. a) List out the phonemic vowels with examples (5M)
   b) Write the phonemic consonants in the following word
      i) Psychology (2M)
   c) Suggest ways to improve Technical vocabulary. (3M)
2. Discuss the differences and similarities between circular writing and memo writing. [10M]
3. Enumerate on the chief characteristics of a good report. [10M]
4. What is presentation? Explain the methods of delivery-Memorising,Reading,and Outlining. [10M]
5. a) Elaborate on the various Reading strategies employed in Reading Comprehension. [5M]
   b) Suggest the various ways of improving reading skills. [5M]
6. a) Why should we give a special attention to English pronunciation? [5M]
   b) What are the major hindrances in Technical writing? [5M]
7. a) Explain the importance of 'an Abstract' in report writing. [5M]
   b) Imagine that you are asked to make a presentation on the topic 'Social Networking'. Write a gist of the topic, which reflects your Preparation for the Presentation. (5M)
8. **Answer any TWO of the following** **2x5M=10M**
   1. Diphthongs b) Qualitative method of writing c) Report on Demonetization