

Code No: R17A0314

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)

R17

III B.Tech I Semester Regular Examinations, November 2019

Machine Tools

(ME)

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.

SECTION-I

1 Explain Merchant's circle diagram and its features [14M]

OR

2 Explain mechanics of metal cutting [14M]

SECTION-II

3 Explain on (a) Quick change tooling system (b) Automatic head changes [14M]

OR

4 List out the parts of Lathe machine and its functions [14M]

SECTION-III

5 Explain terms (a) Twist drill (b) Machining time [14M]

OR

6 Discuss on slotting machine with neat diagram [14M]

SECTION-IV

7 Discuss on (a) types of abrasives (b) Selection of grinding wheel [14M]

OR

8 Classify CNC Milling machines and explain its operations [14M]

SECTION-V

9 Describe Plasma machining and its applications [14M]

OR

10 Explain WJM and its features [14M]

Code No: R17A0312

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Regular Examinations, November 2019

Advanced Thermal Engineering

(ME)

Roll No										
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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.

SECTION-I

- 1 (a) What are the unique features of high pressure boilers when compared to lower pressure boilers? [5M]
(b) Explain the working of a Lamont boiler with a neat sketch. [9M]

OR

- 2 a) Classify types of condensers write difference between surface condensers and jet condensers? [7M]
b) What are the components of a steam condensing plant? What are the functions of each component working in steam condensing plant? [7M]

SECTION-II

- 3 Steam used in a reheat cycle for the working of steam engine. The steam leaves the boiler and enters the turbine at 3 MPa and 350°C. After expansion in the turbine to 500 KPa, the steam is reheated to 500°C and then expanded in the low pressure turbine to 20 KPa. Determine the efficiency of the reheat cycle. [14M]

OR

- 4 A convergent- divergent steam nozzle is required to deliver 2 kg of steam per second. The nozzle is supplied with steam at 10 bar (abs) and temperature 200°C, while steam exists from the nozzle at 0.34 bar (abs). Calculate the throat and exit areas of the nozzle. Assume the flow of steam through the nozzle to be isentropic and the index of expansion to be 1.3. If the nozzle efficiency is assumed to be 85 %, calculate the exit area of the nozzle. [14M]

SECTION-III

- 5 A single state impulse turbine rotor has a diameter of 1.1 m and running at 3200 rpm. The nozzle angle is 22°. The blade speed ratio is 0.45. The ratio of the blade velocity at outside to the relative velocity at inlet is 0.95. The outlet angle of the blade is 10° smaller than the inlet angle. The steam flow rate is 2 kg/sec. Draw the velocity diagram and estimate:
(a) Velocity of whirl. (b) Axial thrust on the bearings. (c) Blade angles. (d) Power developed. [14M]

OR

- 6 a) Define the term 'Degree of reaction' as applied to a steam turbine. Show that Parson's reaction turbine the degree of reaction is 50 % ? [7M]
b) Write comparison between impulse turbine and reaction turbines? [7M]

SECTION-IV

- 7 a) Discuss the relative advantages and disadvantages of gas turbines and steam turbines. [5M]
b) Describe with a suitable sketch the constant pressure open cycle gas turbine [9M]
OR
- 8 a) Draw the schematic diagram of closed cycle gas turbine and explain its working. [6M]
b) A constant pressure open cycle gas turbine plant works between temperature range of 15°C and 700°C and pressure ratio of 6. Find the mass of air circulating in the installation, if it develops 1100 kW. Also find the heat supplied by the heating chamber. [8M]

SECTION-V

- 9 a) Explain the Ram-Jet engine with neat sketch. [7M]
b) Explain the turbo prop with a neat sketch. [7M]
OR
- 10 A turbojet engine consumes air at the rate of 60.2 kg/s when flying at a speed of 1000 km/hr. Calculate: (i) Exit velocity of the jet when the enthalpy change for the nozzle is 230 kJ/kg and velocity coefficient is 0.96. (ii) Fuel flow rate in kg/s when air fuel ratio is 70:1. (iii) Thrust specific fuel consumption. (iv) Thermal efficiency of the plant when combustion efficiency is 92% and calorific value of the fuel used is 42000 kJ/kg. (v) Propulsion efficiency [14M]

Code No: R17A0316

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY **R17**

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Regular Examinations, November 2019

Computer Integrated Manufacturing

(ME)

Roll No									
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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.

SECTION-I

1 Explain various statements used in APT with an example. [14M]

OR

2 a. What are the advantages of CAM softwares? [7M]

b. What is the role of post processor in CAM software? Explain. [7M]

SECTION-II

3 a. What do you understand from presetting of tools? Why it is carried out? [7M]

b. Enumerate the advantages and applications of DNC systems. [7M]

OR

4 a. Differentiate Preset and qualified tool holders [7M]

b. Explain the concept of adaptive control machining in detail. [7M]

SECTION-III

5 a. What is the need for post processors in CNC? Explain. [7M]

b. Explain the general structure of post processor. [7M]

OR

6 a. Write about the creation of DAPP based post processor. [7M]

b. Explain the functions of post processors in CNC. [7M]

SECTION-IV

7 a. Explain about microcontrollers and its hardware components. [8M]

b. Explain the applications of PLC in CNC machines. [6M]

OR

8 a. Explain the selection and structure of microcontrollers. [7M]

b. Explain the principle of operation of PLC. [7M]

SECTION-V

9 a. Describe the functioning of hybrid CAPP system. [7M]

b. With a block diagram, explain the functioning of CMM. Also mention its advantages. [7M]

OR

10 Write short notes on

a. Expert system and [7M]

b. Artificial neural networks [7M]

Roll No										
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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.

SECTION-I

- 1 a) What are the primitive data types in Java? Write about type conversions. [8M]
b) Differentiate between a class and object. [6M]

OR

- 2 a) What is a constructor? What is its requirement in programming? Explain with program. [8M]
b) What are java Buzzwords? Explain about them. [6M]

SECTION-II

- 3 How Packages differ from Interfaces? Explain it with a suitable example program to calculate student marks statement. [14M]

OR

- 4 a) Differentiate between interface and abstract class. [8M]
b) Explain multilevel inheritance with the help of abstract class in your program. [6M]

SECTION-III

- 5 a) Explain about java.lang.thread package. [8M]
b) How to set priorities for threads? Discuss with examples. [6M]

OR

- 6 a) What is the role of 'finally' in exception handling? Explain with an example. [8M]
b) List any six built-in exceptions in Java. [6M]

SECTION-IV

- 7 a) Why thread is called a light weight process? What are the different things shared by different threads of a single process? What are the benefits of this sharing? Mention any application for which multithreading is not desired. [8M]
b) How inter thread communication is done in Java? [6M]

OR

- 8 a) What is the role of event listeners in event handling? List the Java event listeners. [8M]
b) List the explain different byte stream classes. [6M]

SECTION-V

- 9 a) Explain about any two Layout Managers with example programs. [8M]
b) Explain the features of Swings in java. [6M]

OR

- 10 a) Explain delegation event model. [8M]
b) Write an Applet to accept user name as a parameter and display welcome message. [6M]

Code No: R17A0313

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)

R17

III B.Tech I Semester Regular Examinations, November 2019

Machine Design – I

(ME)

Roll No									
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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.

SECTION-I

- 1 a) Explain the design considerations for the selection of Engineering Materials and their properties? [7M]
b) Explain the concept of stiffness in tension, bending, torsion and combined situations? [7M]

OR

- 2 Explain briefly the various theory of failures. [14M]

SECTION-II

- 3 (a) Explain the significance of Goodman's line, Soderberg line and modified Goodman line in design of members subjected to reversal of stresses? [10M]

- (b) Explain the influence of stress concentration in the design of machine elements? What are the principal causes of stress concentration? Explain with suitable sketches? [4M]

OR

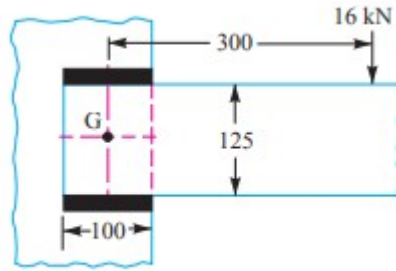
- 4 (a) Explain the types of fluctuating stresses ? [4M]
(b) A cold drawn steel bar is to withstand a tensile preload of 36.3 kN and a fluctuating tensile load varying from 0 to 72.60 kN. The bar has a geometric stress concentration factor of 2.02 corresponding to a fillet whose radius is 4.75 mm. determine the size of the bar for an infinite life and a factor of safety of 2. The material properties are $f_{yp}=588 \text{ N/mm}^2$; $f_{ut}=700 \text{ N/mm}^2$ [10M]

SECTION-III

- 5 Design a triple riveted lap joint, to join two plates of 6 mm thick. The allowable stresses are: $\sigma_t = 80 \text{ MPa}$, $\sigma_c = 100 \text{ MPa}$, and $\tau = 60 \text{ MPa}$. Calculate the rivet diameter, rivet pitch, and distance between the rows of rivets. Use zig-zag riveting. State how the joint will fail. [14M]

OR

- 6 A $125 \times 95 \times 10 \text{ mm}$ angle is welded to a frame by two 10 mm fillet welds, as shown in Fig. A load of 16 kN is applied normal to the gravity axis at a distance of 300 mm from the centre of gravity of welds. Find maximum shear stress in the welds, assuming each weld to be 100 mm long and parallel to the axis of the angle. [14M]



All dimensions in mm.

SECTION-IV

- 7 Design and sketch the cotter joint for load of 150kN. The allowable stresses in tension, compression and shear are 100 N/mm^2 , 160 N/mm^2 and 70 N/mm^2 [14M]
 OR
 8 Two mild steel rods are connected by a knuckle joint to transmit an axial load of 150kN. Design joint completely. Assume the working stresses for both the pin and rod materials as 80 N/mm^2 in shear and 160 N/mm^2 in crushing. Assume that the rods to be connected are not very long. [14M]

SECTION-V

- 9 Design a suitable diameter for a circular shaft required to transmit 90kW at 180 rpm. The shear stress in the shaft is not to exceed 70 MPa and the maximum torque exceeds the mean by 40%. Also find the angle of twist in a length of 2 meters. Take $C=90\text{GPa}$ [14M]
 OR
 10 Design a rigid sleeve coupling to connect two shafts transmitting 18.75 kW at 1000 rpm, The allowable shear stress in the material of the shaft is 55 N/mm^2 . The material of the key and shaft is same and the coupling is required to transmit 20% overload. The material of sleeve is cast iron the allowable shear stress is 16MPa. Make a neat sketch of designed sleeve coupling. [14M]

Code No: R17A0315

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY **R17**

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Regular Examinations, November 2019

Metrology and Surface Engineering

(ME)

Roll No									
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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.

SECTION-I

- 1 a) Differentiate between hole basis system and shaft basis system. [7M]
b) Find the values of allowance and tolerance for the hole and shaft assembly for the following dimension of the mating parts. [7M]

Hole: $30^{+0.08}_{+0.00}$, Shaft: $30^{-0.02}_{-0.05}$

OR

- 2 The gear ring of 85 mm diameter bore is fitted onto a hub resting in a H_7j_6 fit. [14M]
Calculate the tolerance and hence limits of hub and gear bore. Specify the type of fit. Diameter steps are 80 – 100 mm. Fundamental deviation for j shaft is -0.009 mm. Follow hole basis system

SECTION-II

- 3 a) Explain with a neat sketch the working mechanism of a gear and pinion type dial indicator. [7M]
b) Explain how sin bar used to measure angles of components of small size and larger size. [7M]

OR

- 4 Calculate the dimensions of plug and ring gauges to control the production of 50 mm shaft and hole pair of H7d8 as per IS specifications. The following assumptions are to be made: [14M]
a) Diameter steps 30 mm & 50 mm.
b) Upper deviation of shaft is given by $-16D^{0.44}$.
c) Lower deviation of hole is zero.

SECTION-III

- 5 a) Explain the constructional details and working of tool maker's microscope with a neat sketch. Mention its applications. [7M]
b) Explain the principle and working of optical projector. [7M]

OR

- 6 a) Explain the procedure to check the flatness of the slip gauges using optical flats [7M]
b) State various applications of straight edges. [7M]

SECTION-IV

- 7 Enumerate various methods of measuring surface finish. [14M]

OR

- 8 a) Explain the elements of surface texture with a neat sketch. [7M]
b) The heights of peaks and valleys of 20 successive points on a surface are [7M]

35, 25, 40, 22, 35, 18, 42, 25, 35, 22, 36, 18, 42, 22, 32, 21, 37, 18, 35, 20 microns respectively measured over a length of 20 mm. Calculate the CLA and RMS roughness values of the surface.

SECTION-V

- 9** a) Explain Johanson Mikrokator comparator with a neat sketch. [7M]
b) What is CMM? Explain their role / applications in modern manufacturing scenario. [7M]

OR

- 10** Explain one wire, two wire and three wire method to find the effective diameter of a given thread. [14M]

Code No: R17A0315

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, Dec-21/Jan-22

Metrology and Surface Engineering

(ME)

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.

Note: Metrology Tables are permitted

SECTION-I

- 1 (a) Distinguish the difference between interchangeability and selective assembly [7M]
(b) A 80mm ϕ 6 shaft is to be checked by a GO-,NO-GO snap gauge. Assume 5% wear Allowance and 10% gauge makers (% of the tolerance of shaft). The fundamental Deviation form fit is (IT7-IT6) where multiple for grade 17 is IT6 is 10. [7M]

OR

- 2 (a) Describe principal features of the Indian standard system of limits and fits for plain work. [7M]
(b) Explain unilateral system and bilateral system of tolerances. [7M]

SECTION-II

- 3 (a) What is Taylors principle as applied to the design of limit gauges? [7M]
(b) Design a suitable GO and NO-GO plug gauge for a bore hole 25.1/25.0mm diameter [7M]

OR

- 4 (a) Describe how you would check the accuracy of a circular table by means of an autocollimator and set of angles with neat diagrams [7M]
(b) Describe three methods of precision angular measurement other than those using balls and rollers as accessories and sketch a practical application of each. [7M]

SECTION-III

- 5 Draw the constructional members of tool makers microscope. Also explain the procedure to find the thread angle, pitch and effective diameter using tool makers microscope. [14M]

OR

- 6 (a) Discuss the method of testing the straightness by spirit level and auto collimator. [7M]
(b) What is the difficulty in using the optical flat alone? How do you overcome this difficulty in the interferometer? [7M]

SECTION-IV

- 7 Write the differences between surface roughness and surface waviness. Also explain the Numerical assessment of surface finish with neat diagrams [14M]

OR

- 8 Draw and explain the method of measurement of surface finish using [14M]

profilograph and Talysurf explain with neat diagram.

SECTION-V

- 9** (a) Describe a pitch measuring machine with a neat diagram [7M]
(b) Describe a method of measuring drunkenness of 31mm dia X 2mm pitch component machined on centres [7M]

OR

- 10** Draw and explain the working of electrical and mechanical comparators with neat diagram [14M]

Code No: R17A0552

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, Dec-21/Jan-22

Introduction to Java Programming

(EEE, ME, ECE & AE)

Roll No									
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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.

SECTION-I

1 Describe the benefits and applications of object-oriented programming. Explain operator precedence rules with a relevant example [14M]

OR

2 What is the method? Explain method overloading with the relevant java program. Write a Java program to add a set of numbers passed from the command line. [14M]

SECTION-II

3 Write the uses of Polymorphism? Prove that the fields in an interface are implicitly static and final. [14M]

OR

4 What is inheritance? Classify different types of inheritance? Compare Interfaces Vs Abstract classes? [14M]

SECTION-III

5 What do you mean by Exception and Error? List out the keywords for exception handling and write steps to develop user defined exceptions. [14M]

OR

6 Is multithreading suitable for all types of applications. If yes explain any such application. If no, explain any application for which multithreading is not desired. [14M]

SECTION-IV

7 Analyze Handling mouse and keyboard events with suitable Programming examples. [14M]

OR

8 Differentiate Applets and Applications. Write a java program using applet. [14M]

SECTION-V

9 Explain the components in creating CheckBox, Button, Label in AWT [14M]

OR

10 Explain various Layout Managers with example program. [14M]

Code No: R17A0312

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY **R17**
(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, Dec-21/Jan-22

Advanced Thermal Engineering

(ME)

Roll No									
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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.

Note: Steam Tables and Mollier charts are permitted

SECTION-I

1 Explain the working and construction of any one type of fire tube boiler with a neat sketch [14M]

OR

2 With a neat sketch explain the working of a high level jet condenser and evaporative condenser [14M]

SECTION-II

3 a) Explain the working of Rankine cycle with Schematic diagram. [7M]

b) Dry saturated steam at 17.5 bar enters the turbine of a steam power plant and expands to the condenser pressure of 0.75 bar. Determine the Carnot and Rankine cycle efficiencies. Also find the work ratio of the Rankine cycle. [7M]

OR

4 a) Discuss the function of the convergent portion, throat and divergent portion of a convergent divergent nozzle with reference to flow of steam. [7M]

b) In a steam nozzle, the steam expands from 4bar to 1bar. The initial velocity is 60m/s and the initial temperature is 200°C. Determine the exit velocity if the nozzle efficiency is 92%. [7M]

SECTION-III

5 a) Give the comparisons between Impulse and Reaction turbines. [7M]

b) Derive the condition for maximum efficiency of an impulse turbine. [7M]

OR

6 In a stage of a Parson's reaction turbine, the mean diameter of the wheel is 1.05m and the speed is 3000 rpm. The angles of receiving tips are 35° and the discharging tip is 20°. If the steam flow rate is 1 kg/min, draw the velocity diagram for blades and Evaluate (i) Tangential thrust on blades, (ii) Axial thrust on blades, (iii) Power developed in the turbine. [14M]

SECTION-IV

7 Describe with neat sketches the working of a simple constant pressure open cycle gas turbine and explain the methods employed for improvement of thermal efficiency of open cycle gas turbine [14M]

OR

8 A gas turbine unit has a pressure ratio of 6 and maximum cycle temperature of 610°C. The isentropic efficiency of turbine and compressor are 0.82 and 0.8 respectively. [14M]

Calculate the power output in kW of an electric generator, geared to the turbine, when air enters the compressor at 15°C at a rate of 16kg/s . Take $C_p = 1.005\text{ kJ/kg}$. K and $\gamma = 1.4$ for compression process and $C_p = 1.11\text{ kJ/kg}$. K and $\gamma = 1.333$ for expansion process.

SECTION-V

- 9** With a neat sketch explain the working principle of turbo jet and turbo propellant engines. State their merits and demerits **[14M]**

OR

- 10** Explain (i) Solid Propellant Rockets (ii) Liquid Propellant Rockets **[14M]**

Code No: R17A0316

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY **R17**

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, Dec-21/Jan-22

Computer Integrated Manufacturing

(ME)

Roll No									
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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.

SECTION-I

1 What is APT programming? Explain with an example. [14M]

OR

2 In brief explain about Computer assisted part programming and Computer automated part programming. [14M]

SECTION-II

3 Write the advantages and disadvantages of coolant fed tooling system and quick change tooling system. [14M]

OR

4 What is an Adaptive control of machining processes? Explain different types of Adaptive control of machining processes with neat diagrams. [14M]

SECTION-III

5 What do you understand by Post Processors for CNC? And explain different functions of a Post Processor. [14M]

OR

6 What is DAPP? Explain different variables in DAPP. [14M]

SECTION-IV

7 What are Micro Controllers used for? Explain about different hardware components in Micro Controllers. [14M]

OR

8 Write the different Applications of PLC's in CNC Machines. Explain any two with neat diagrams. [14M]

SECTION-V

9 What is Computer Aided Process Planning? Explain briefly about Hybrid CAAP System and Computer Aided Inspection and quality control [14M]

OR

10 Define Artificial Intelligence. Explain briefly about Artificial Neural Networks with any two suitable examples. [14M]

Code No: R17A0314

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)

R17

III B.Tech I Semester Supplementary Examinations, February 2021

Machine Tools

(ME)

Roll No									
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Time: 2 hours 30 min

Max. Marks: 70

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 Explain the Geometry of a single point cutting tool and its angles. [14M]
- 2 What is a coolant and in what way is it useful in metal cutting? Discuss various types of coolants. [14M]
- 3 Briefly explain with neat sketches the types of work holding devices that are commonly employed in lathe. Specify the limitations of them. [14M]
- 4 Discuss various elements of CNC machine and its structure. [14M]
- 5 Explain the quick return motion mechanism in shaping with a neat sketch? [14M]
- 6 List and explain the various types of hole making operations. [14M]
- 7 Explain with a neat sketch the construction and working of different surface grinding machines? [14M]
- 8 Explain the principle and construction of abrasive water jet machining with neat sketch? [14M]

Code No: R17A0312

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

R17

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, February 2021

Advanced Thermal Engineering

(ME)

Roll No										
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Time: 2 hours 30 min

Max. Marks: 70

Answer Any Five Questions
All Questions carries equal marks.

NOTE: Steam Tables are permitted.

- 1 Explain the working and construction of any one type of fire tube boiler with a neat sketch. [14M]
- 2 Explain the working of any two surface condensers with neat diagrams [14M]
- 3 A steam power plant has boiler and condenser pressure of 60 bar and 0.1 bar, respectively. Steam coming out of the boiler is dry and saturated. The plant operates on the rankine cycle. Calculate thermal efficiency. [14M]
- 4 Explain the function of steam nozzles, state its types and derive the expression for the calculation of steam velocity at the exit of the nozzle with the help of steady flow energy equation. [14M]
- 5 In a stage of an impulse turbine provided with a single row wheel, the mean diameter of the blade ring is 100 cm and the speed of rotation is 3000 rpm. The steam issues from the nozzles with a velocity of 360 ms and the nozzle angle is 20° . The rotor blades are equiangular and due to friction in the blade channel the relative velocity of steam at the outlet from the blades is 0.85 times of that at the inlet. Determine the power developed in the blades when the axial thrust on the blade is 160 N. [14M]
- 6 What do you mean by degree of reaction and show that the blades are symmetric for 50% degree of reaction? [14M]
- 7 What are the different methods used to improve efficiency of a gas turbine plant? Explain any one method with a neat sketch. [14M]
- 8 Explain briefly with a sketch the working principle of a rocket engine. [14M]

Code No: R17A0316

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

R17

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, February 2021

Computer Integrated Manufacturing

(ME)

Roll No									
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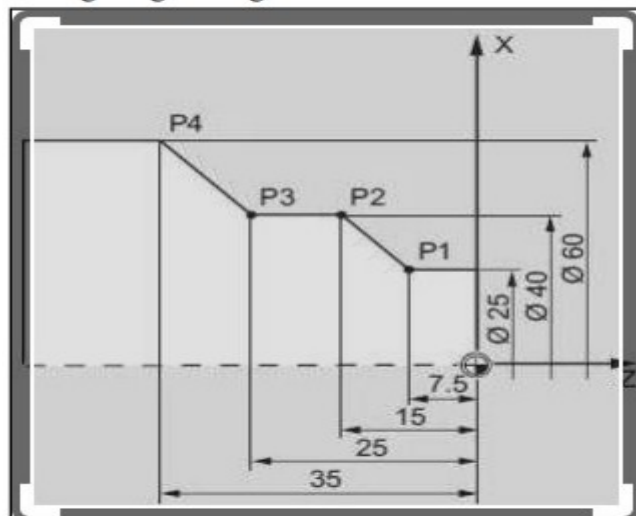
Time: 2 hours 30 min

Max. Marks: 70

Answer Any Five Questions
All Questions carries equal marks.

- 1 Write the CNC part programming for given figure.

[14M]



- 2 a) Explain the four types of APT statements with examples. [7M]
b) Explain any five preparatory commands with examples. [7M]
- 3 a) Explain adaptive control with constraints for turning with neat sketch. [7M]
b) Write a brief note on Interchangeable tooling system, preset and qualified tools and coolant fed tooling system. [7M]
- 4 a) Explain the components of Direct Numerical Control machine(DNC) in detail. [7M]
b) Discuss the advantages and disadvantages of DNC. [7M]
- 5 a) Write about the DAPP based post processor. [7M]
b) Explain the functions of a post processor in detail. [7M]
- 6 a) Explain the necessity of postprocessor in CNC and the structure of postprocessor. [7M]
b) Give out the differences between open and closed loop system. [7M]
- 7 a) Discuss the applications and functions of Microcontrollers. [7M]
b) Explain the basic structure and functions of PLC. [7M]
- 8 a) Explain in detail about the computer aided testing. [7M]
b) Write the Elements in CMM and write the limitations of CMM. [7M]

Code No: R17A0552

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

R17

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, February 2021

Introduction to Java Programming

(EEE, ME, ECE & AE)

Roll No									
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Time: 2 hours 30 min

Max. Marks: 70

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 A) Illustrate various data types and variables categories in OOP with an example [10M]
B) Analyze the concept of Buffered Reader class and explain with an example [4M]
- 2 A) Examine the Types and Concepts of Constructors with an example [7M]
B) Discuss the various categories of Control statements in OOP [7M]
- 3 Explain different types of inheritance in detail ,Mention an example for each type of inheritance [14M]
- 4 Inspect how we can implement interfaces in Java and construct an example for the concept of interfaces [14M]
- 5 A)Write a program to illustrate the use of multiple catch blocks for a try block. [7M]
B) Explain Thread life cycle. [7M]
- 6 A)What are the uses of ‘throw’ and ‘throws’ clauses for exception handling? [7M]
B) Explain the checked and unchecked exception with an example [7M]
- 7 A) What is the life cycle of applets and explain in detail [7M]
B) Give an overview of Byte Streams [7M]
- 8 What is the significance of layout managers? Discuss briefly various layout managers. [14M]

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)

R17

III B.Tech I Semester Supplementary Examinations, February 2021

Machine Design - I

(ME)

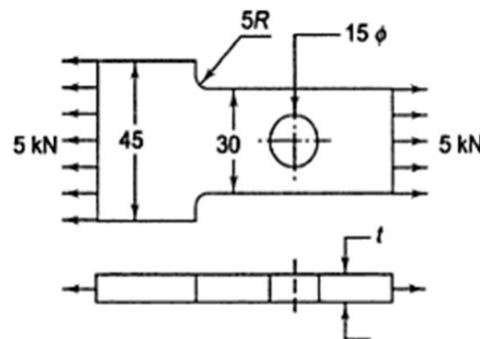
Roll No									
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Time: 2 hours 30 min

Max. Marks: 70

Answer Any Five Questions
All Questions carries equal marks.

- 1 a. What are the desirable mechanical properties of metals? Explain about it. [7M]
b. Write down all the formulas for principal theories of failure for a member subjected to biaxial stress system [7M]
- 2 a. What important design considerations are required to be taken into for casting? [7M]
b. The load on a bolt consists of an axial pull of 10 kN together with a transverse shear force of 5kN. Find the diameter of bolt required according to
i. Maximum principal stress theory; [7M]
ii. Maximum shear stress theory.
- 3 a. Explain stress concentration with suitable examples and discuss the methods to reduce stress concentrations [6M]
b. A machine component is subjected to fluctuating stress that varies from 40 to 100 N/mm² The corrected endurance limit stress for machine component is 270 N/mm². The ultimate tensile strength and yield strength of material are 600 and 450 N/mm² respectively. Find the factor of safety using: (i) Goodman theory (ii) Soderberg line [8M]
- 4 A flat plate subjected to a tensile force of 5kN is shown in figure. The plate material is Gray cast iron FG 200 and the factor of safety is 2.5. Determine the thickness of the plate taking stress concentration into consideration [14M]



- 5 a. State the assumptions made in the design of welded joint [7M]
b. With a neat sketches explain Caulking and Fullering in riveted joint [7M]

- 6 Design a double riveted butt joint with two cover plates for the longitudinal seam of a boiler shell 15mm in diameter subjected to a steam pressure of 0.95 N/mm². Assume joint efficiency as 75% allowable tensile stress in the plate 90 MPa compressive stress 140 MPa; and shear stress in the rivet 56 MPa [14M]
- 7 Design a knuckle joint to transmit 150 kN. The design stresses may be taken as 75 MPa in tension, 60 MPa in shear and 150 MPa in compression. [14M]
- 8 Design a cast iron protective flange coupling to connect two shafts in order to transmit 7.5 kW at 720 rpm. The following permissible stresses are given as, Permissible shear stress for shaft, bolt and key material = 33 MPa Permissible crushing stress for bolt and key material = 60 MPa Permissible shear stress for the cast iron = 15 MPa. [14M]

Code No: R17A0315

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY **R17**
(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, February 2021
Metrology and Surface Engineering

(ME)

Roll No										
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Time: 2 hours 30 min

Max. Marks: 70

Answer Any **Five** Questions
All Questions carries equal marks.

- 1 (a). Briefly describe the principle features of Indian Standard system of fits. [6M]
Explain how you proceed to specify the tolerance on the mating components of transition fit. [8M]
(b). With a neat diagram explain the hole and shaft basis system
- 2 (a). Determine the tolerances on the hole and the shaft for a precision running fit designated by 50H7/g6. [7M]
The following aid can be used for solving problem 50mm lies between the range 30-50 mm.
 $i = 0.46 (D)^{1/3} + 0.001 (D)$
Fundamental deviation for H = 0, Fundamental deviation for shaft g = -2.5 (D)^{0.34}
Find the actual maximum and minimum sizes of the both hole and shaft and maximum and minimum clearances.
(b). Distinguish between interchangeability and selective assembly [7M]
- 3 (a) State Taylor's principle for designing of limit gauges. Discuss some factors which lead to deviation in adopting Taylor's principle in practice? [7M]
(b). Design suitable limit gauge conforming to Taylor's principle for checking a 60 H7 square hole 25mm wide. How many gauges are required to check this work? Sketch these gauges [7M]
- 4 Draw and explain different range of plug gauges and ring gauges [14M]
- 5 With neat diagram illustrate the principle of a typical injected graticule auto collimator and write its limitations [14M]
- 6 Discuss various methods for measuring flat surface measurement with suitable diagrams. [14M]
- 7 Explain the process of measurement of surface finish using profilograph and Talysurf with neat diagrams [14M]
- 8 (a). Draw and explain the major elements of screw thread [7M]
(b) How to measure the effective diameter of the of a thread. Explain various methods for measuring effective diameter [7M]

Code No: R17A0314

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY **R17**
(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, October 2020

Machine Tools

(ME)

Roll No									
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Time: 2 hours

Max. Marks: 70

Answer Any **Four** Questions
All Questions carries equal marks.

- 1 Explain various types chips developed in metal cutting
- 2 Explain single point cutting tool geometry
- 3 Explain operations of lathe machine
- 4 Discuss concept of interchangeable tooling system
- 5 Explain shaper with neat sketch
- 6 Explain deep hole drilling machine
- 7 Discuss on principle working of CNC milling machine
- 8 Explain EDM and its applications

Code No: R17A0312

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY **R17** **GY**
(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, October 2020

Advanced Thermal Engineering

(ME)

Roll No										
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Time: 2 hours

Max. Marks: 70

Answer Any **Four** Questions
All Questions carries equal marks.

- 1 (a) With a neat sketch explain the principle of working of a Babcock and Wilcox water tube steam boiler.
(b) What are the advantages of fire tube over water tube boiler?
- 2 With neat sketch explain working of low level and high level jet condensers?
- 3 A steam power station uses the following cycle: Steam at boiler outlet 150 bar 550°C, reheat at 40 bar to 550°C, condenser at 0.1 bar. Using the Mollier chart assuming ideal process find: (i) Quality at turbine exhaust. (ii) Cycle efficiency. (iii) Steam rate.
- 4 A set of 16 nozzles for an impulse turbine receives steam at 16 bar and 300°C. The pressure of steam at exit is 10 bar. If the total discharge is 245 kg/min and efficiency of nozzle is 90%, calculate the cross sectional area at the exit of each nozzle. If the steam has a velocity of 100 m/sec at the entry to the nozzles, calculate the percentage increase in discharge
- 5 In a Delaval turbine, the steam issues from the nozzles with a velocity of 850 m/s. The nozzle angle is 20°. Mean blade velocity 350 m/s. The blades are equiangular. The mass flow rate is 1000 kg/min. Friction factor is 0.8. Determine: (i) Blade angles. (ii) Axial thrust on the bearing. (iii) Power developed. (iv) Blade efficiency. (v) Stage efficiency if nozzle efficiency is 93%.
- 6 In a reaction turbine, the tips are inclined at 40° and 25° to the direction of motion. The guide blades are of the same shape as the moving blades, but reverse in direction. At some point in the turbine, the drum diameter is 1.2 m and blades are 100 mm high. At this place, the steam has a pressure of 2 bar and dryness fraction 0.9. If the speed of this machine is 300 rpm and the steam passes through the blades without shock, find the mass flow rate of steam and power developed in the ring of moving blades.
- 7 a) Explain multi stage compression with inter cooling of gas turbine?
b) Write comparisons between open cycle and closed cycle gas turbines?
- 8 a) A turbo-jet engine flying at a speed of 960 km/h consumes air at the rate of 54.5 kg/s. calculate i). Exit velocity of the jet when the enthalpy change for the nozzle is 200 KJ/kg and velocity coefficient is 0.97. ii) fuel flow rate in kg/s when air fuel ratio is 75:1 iii). Thrust specific fuel consumption iv) propulsive power v). propulsive efficiency.
b) Explain the working difference between propeller jet, turbo jet and turbo prop.

Code No: R17A0316

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY **R17**
(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, October 2020
Computer Integrated Manufacturing

(ME)

Roll No										
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Time: 2 hours

Max. Marks: 70

Answer Any **Four** Questions
All Questions carries equal marks.

- 1 a. Discuss the structure of APT program.
b. What is the purpose of a part program?
c. What are the advantages of manual part programming?
- 2 a. What are the advantages of computer assisted part programming over manual part programming?
b. Discuss the advantages of CNC program using CAM software.
- 3 a. Enumerate the differences between CNC and DNC.
b. Distinguish between ACC and ACO.
- 4 a. Write a short note on pre-set tools and qualified tools.
b. Explain the functions of DNC.
- 5 a. What is DAPP? Discuss the major variables in DAPP based post processor.
b. What are the automated functions of post processors?
- 6 Discuss the necessity of post processor and write the advantages and applications of post processors.
- 7 Write a short note on programming of micro controller.
- 8 Explain the variant and generative type CAPP systems in detail.

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, October 2020

Introduction to Java Programming

(EEE, ME, ECE & AE)

Roll No										
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Time: 2 hours

Max. Marks: 70

Answer Any **Four** Questions
All Questions carries equal marks.

- 1 a) Explain briefly the following object oriented concepts.
i) Abstraction ii) Polymorphism
- b) "Java is called Machine Independent language" - Justify this statement with proper explanation.
- 2 a) What is an array? How arrays are declared and initialized? Explain with examples.
- b) Write a java program to check the given string is a palindrome or not.
- 3 a) What are the different forms of inheritance? Explain with examples.
- b) With suitable program segments describe the usage of 'super' keyword.
- 4 a) Explain method overriding with a suitable example program.
- b) What is interface? Explain how to create and access it.
- 5 a) Write a Java program to demonstrate multithreading operation.
- b) Explain various thread states and properties in detail.
- 6 What is an exception? How are exceptions handled in Java programming? Explain
- 7 a) Describe the different stages in the life cycle of an Applet.
- b) Explain in brief the event-handling mechanism in java with an example.
- 8 a) Design a screen in Java which accepts text in text box. If the left mouse is clicked, convert the text to uppercase and if the right button is clicked, convert it to lower case.
- b) Write a short note on the following
i) JFrame ii) JTabbedPane

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
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R17

III B.Tech I Semester Supplementary Examinations, October 2020

Machine Design - I

(ME)

Roll No									
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Time: 2 hours

Max. Marks: 70

Answer Any **Four** Questions
All Questions carries equal marks.

- 1 a) What are the general considerations in the design of machine elements?
b) A cast iron pulley transmits 12 KW at 500 rpm. The diameter of the pulley is 1.2meter and it has four straight arms of elliptical cross section. In which the major axis is twice the minor axis. Determine the dimensions of the arm if the allowable bending stress is 15 MPa
- 2 a) Explain Goodman failure theory.
b) A circular bar of 0.5 m length is supported freely at its two ends. It is acted upon by a central concentrated cyclic load having a minimum value of 20 kN and a maximum value of 50 kN. Determine the diameter of bar by taking a factor of safety of 2, size factor of 0.85, surface finish factor of 0.9. The material properties of bar is given by: Ultimate strength of 600 MPa, Yield strength of 500 MPa and Endurance strength of 350 MPa.
- 3 A steel shaft is subjected to a completely reversed bending moment of 100kNm. The shaft transmits 735.5kW at 100 rpm. The torque varies over a range of +/- 40%. Determine the diameter of shat.
Take : $f_{yp}=400 \text{ N/mm}^2$; $f_e=300 \text{ N/mm}^2$ and FS=2.5
- 4 (a) What is the difference between endurance limit and fatigue strength of a material ?
(b) How the localized stresses in machine members can be avoided ?
(c) Explain the impotance of stress concentration factor ?
- 5 A double riveted, zig-zag butt joint, in which the pitch of the rivets in the outer row is twice that in the inner rows; connects two 16 mm plates with two cover plates, each 12 mm thick. Determine the diameter of the rivets and pitch of the rivets if the working stresses are: $\sigma_t = 100 \text{ MPa}$, $\sigma_c = 150 \text{ MPa}$, and $\tau = 75 \text{ MPa}$.
- 6 (a) Advantages and disadvantages of screw fasteners ?
(b) Explain the design procedure for the eccentrically loaded bolted joint.
- 7 Design and sketch a cotter joint for fastening piston rod to cross head of a engine having cylinder diameter 250 mm and steam pressure 1.05 N/mm^2 The thickness of cotter is to be 0.3 times piston rod diameter at the point where cotter is located. The allowable stresses in tension, compression and shear are 50 N/mm^2 40 N/mm^2 and 84 N/mm^2 respectively.
- 8 Two 40 mm shafts are connected by a flange coupling. The flanges are fitted with six bolts of carbon steel on a 125 mm bolt circle. The shafts are run at a 340 rpm and transmit a torsional moment of 1000Nm. Assume a factor of safety 5. Design the coupling.

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

R17

(Autonomous Institution – UGC, Govt. of India)

III B.Tech I Semester Supplementary Examinations, October 2020

Metrology and Surface Engineering

(ME)

Roll No										
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Time: 2 hours

Max. Marks: 70

Answer Any **Four** Questions

All Questions carries equal marks.

- 1 a) Draw the conventional diagram of limits and fits and explain the terms.
Basic size
 - i. Upper deviation
 - ii. Lower deviation
 - iii. Fundamental deviation.b) A 75 mm shaft rotates in a bearing. The tolerance for both shaft and bearing is 0.075 mm and the required allowance is 0.10 mm. determine the dimensions of the shaft and the bearing bore with the basic hole standard.
- 2 In a hole and shaft assembly of 30 mm nominal size, the tolerances for hole and shaft are as specified below:
Hole: $30_{+0.00}^{+0.02}$, Shaft: $30_{-0.07}^{-0.04}$
 - i. Determine the maximum and minimum clearances available.
 - ii. Allowances.
 - iii. Hole and shaft tolerances.
 - iv. Maximum metal limit of shaft and hole.
 - v. Minimum metal limit of shaft and hole.
 - vi. Type of fit that is possible.
- 3 a) Distinguish between line standard and end standard.
b) With the help of diagrams, describe the uses of Plug, Ring and Snap gauges in detail.
- 4 a) Describe Taylor's principle of gauge design.
b) Explain the brief method of measuring a taper plug gauge by rollers, slip gauges and micrometer
- 5 a) Explain the principle and working of a NPL Flatness Interferometer with a neat sketch. List out its advantages and limitations.
b) With a sketch, explain the construction of autocollimator. What are its applications?
- 6 Describe the use of optical flats and monochromatic light for dimensional comparison and testing flatness of surfaces.
- 7 a) List out the different parameters used in surface roughness measurement and explain them.
b) Explain the working principle of Taylor Hobson Talysurf measurement of surface finish.
- 8 a) Sketch and explain three wire method of measuring the effective diameter of a screw thread.
b) Explain the working principle of an optical comparator with a neat sketch.
