Code No: **R18A0061**

R18

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular Examinations, February 2021
Managerial Economics Financial Analysis
(ME&AE)

Roll No										

Time: 2 hours 30 min   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1	(a) Define Managerial Economics. Explain its Nature.	**[7M+7M]**
	(b) Discuss the importance of Managerial Economics in decision making.	
2	State the 'Law of Demand', its exceptions. What are the various factors that determine the demand for a Mobile Phone?	**[14M]**
3	A company reported the following results for two periods.	**[14M]**

Period   Sales   Profit
  I   Rs.20,00,000   Rs.2,00,000
  II   Rs.25,00,000   Rs.3,00,000
Ascertain the BEP, P/V Ratio, Fixed cost and Margin of Safety

4	(a) Explain Iso costs & Iso quant	**[10M+4M]**
	(b) Explain Cobb-Douglas Production Function	
5	(a) How is market price determined under conditions of Perfect Market Competition?	**[7M+7M]**
	(b) Explain in detail, the important features of perfect competition	
6	a) What are the causes for the emergence of Monopoly?	**[7M+7M]**
	b) How is the equilibrium position attained by a monopolist under varying cost Conditions?	
7	Explain the purpose of preparing the following accounts/statements and also elaborate the various items that appear in each of them.	**[7M+7M]**
	a) Trading Account	
	b) Profit & Loss Account	
8	Determine the Pay Back Period, NPV@ 10% for the information given below	**[7M+7M]**
	a) The project cost is Rs. 20,000	
	b) The life of the project is 5 years	
	c) The cash flows for the 5 years are Rs.10,000, Rs.12,000; Rs.13,000; Rs.11,000; and Rs. 10,000 respectively and	

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MALLA REDDY COLLEGE OF ENGINEERING & TECH____GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular Examinations, February 2021
Manufacturing Processes
(ME)

Roll No										

Time: 2 hours 30 min   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1	a) Differentiate between pressurized and unpressurised gating systems with reference to the applications.	[7M]
	b) What purpose is served by the risers in sand casting? Explain the principles of design of risers.	[7M]
2	a) With a neat sketch, explain the various steps involved in shell moulding process and mention its advantages and disadvantages.	[8M]
	b) List the types of moulding sand. Discuss the desirable properties of moulding sand.	[6M]
3	a) What are the different types of flames produced in oxy-acetylene gas welding and explain in brief with neat sketch.	[7M]
	b) With a neat sketch explain Thermit welding process.	[7M]
4	a) Explain with a neat sketch the principle working of TIG welding process.	[7M]
	b) Explain in detail the induction welding process.	[7M]
5	a) Give the comparison between the hot working and cold working processes.	[7M]
	b) What do you mean by the following terms?	[7M]
	(i) Coining	
	(ii) Embossing	
	(iii) High-energy rate forming	
6	a) What is rolling? Discuss briefly principle and mechanism of rolling process.	[7M]
	b) Write short note on the plastic blow moulding process.	[7M]
7	a) Differentiate hot extrusion and cold extrusion processes.	[7M]
	b) Sketch and explain forging hammers. What are the advantages of cold forging?	[7M]
8	a) What are different types of materials available for the SLS system? What are their respective applications?	[7M]
	b) List out technical specifications of 3D printer.	[7M]

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular Examinations, February 2021
**Computer Integrated Manufacturing Technologies**
(ME)

Roll No										

Time: 2 hours 30 min   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1   (a) Explain about the chip formation and mention the types of chips?   **[4M]**
     (b) What are the assumptions made in merchant's theory? With neat sketch derive   **[10M]**
the expressions for forces developed during machining in terms of cutting force and
thrust force.

2   (a) With the neat sketches explain about three-jaw and four-jaw chucks and mention   **[8M]**
their merits and demerits.   **[6M]**
     (b) Explain about the face plate, angle plate and drive plate.

3   (a) Give a neat sketch of a slotter and describe its main parts.   **[7M]**
     (b) Give similarities and differences among shaping, and slotting machines with
respect to constructed features, applications and working.   **[7M]**

4   (a) Briefly explain the constructional features and working of a radial drilling   **[7M]**
machine with a neat sketch.   **[7M]**
     (b) Describe with the help of a neat diagram the construction and working of a
precision horizontal boring machine? And mention some salient design
features?

5   (a) Write short notes on the following Automatically Programmed Tolling   **[9M]**
motioncommands.   **[5M]**
     (i) Setup commands ii) Point to point motion commands iii) Continuous path motion
commands
     (b) Write the APT geometry statement for the following component shown in the
figure.
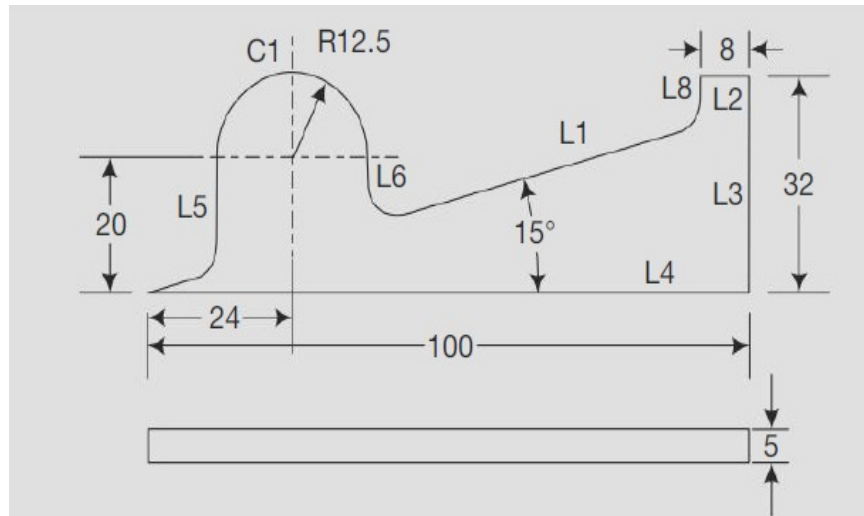
6	(a) Compare NC and CNC machines in terms of their advantages and disadvantages?	[6M]
	(a) Explain about Automatic Tool Changers (ATC) and its advantages	[8M]
7	(a) What is adaptive control with constraints? How is it used in CNC machines?	[8M]
	(b) What are the functions served by DNC?	[6M]
8	(a) Explain different types of CMMs structures with neat sketches.	[8M]
	(b) What is a probe in CMM? Explain how it works.	[6M]

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Code No: **R18A0315**

R18

MALLA REDDY COLLEGE OF ENGINEERING & TECH⎯⎯GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular Examinations, February 2021
Design of Hydraulic Pneumatic Systems
(ME)

Roll No										

Time: 2 hours 30 min   **Max. Marks: 70**

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

1	a.	Define Pascal's law and Its Applications.	**[7M]**
	b.	Differentiate external gear pump with lobe pump. Also write the engineering applications of each pump.	**[7M]**
2	a.	Explain the types of fluid flows	**[7M]**
	b.	Explain the fluid power transmission through pipe network.	**[7M]**
3	a.	Mention types of the directional control valve and method of their actuation symbols.	**[7M]**
	b.	What is 5/2 DCV? Explain with neat sketch.	**[7M]**
4	a.	Sketch and explain pressure relief valves.	**[7M]**
	b.	What is the function of hydraulic motors? Explain the working of Rack and pinion semi rotary actuator.	**[7M]**
5		Explain the working of hydraulic accumulator with neat diagram and also list out advantages and disadvantages.	**[14M]**
6	a.	What are the advantages of a hydraulic system?	**[7M]**
	b.	Explain the schematic diagram of Air-over oil intensifier circuit.	**[7M]**
7	a.	Mention the applications of pneumatics in the engineering field.	
	b.	Explain the construction and working of the single acting cylinder of the pneumatic system	[7M] [7M]
8	a.	What are the various steps to select a pneumatic system	**[7M]**
	b.	What are the common faults in the hydraulic system?	**[7M]**

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RA

MALLA REDDY COLLEGE OF ENGINEERING & TECHNO
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular Examinations, February 2021
Data Structures Using Python
(ME & AE)

Roll No										

Time: 2 hours 30 min   **Max. Marks: 70**

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

1	a) Describe python language support for Python operators.	**[7M]**
	b)What is the role of the programmer? List various skills required to become a good programmer.	**[7M]**
2	a) How to do Python Installation and Mention its working	**[7M]**
	b) Develop python program to find largest among three numbers.	**[7M]**
3	a) What is string slices and explain slicing operator in python with example.	**[7M]**
	b) With syntax , Explain the finite and infinite looping constructs in python	**[7M]**
4	Write syntax of all python supported conditional statements along with its usage with an example program to check whether given umber is positive or negative or zero.	**[14M]**
5	a) Define function. Discuss about calling of functions	**[7M]**
	b) Illustrate passing parameters in python programming.	**[7M]**
6	a) Summarize the anonymous function in python programming.	**[7M]**
	b) Recall the fruitful function in python programming.	**[7M]**
7	a) List operations in data structures.	**[7M]**
	b) How Slicing and methods are useful in python.	**[7M]**
8	a) Summarize Various sorting techniques.	**[7M]**
	b) Develop a python program to do bubble sort.	**[7M]**

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Code No: **R18A0313**

R18

MALLA REDDY COLLEGE OF ENGINEERING & TECH___GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular Examinations, February 2021
Internal Combustion Engines
(ME)

Roll No										

Time: 2 hours 30 min   **Max. Marks: 70**

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

1	a.	Differentiate between fuel air cycle and actual cycle of compression ignition engine and explain the salient points.	[14M]
	b.	Why lubrication is required in I C Engines? Write the different methods of lubrication systems.	

2	a.	Draw the schematic diagram of two stroke petrol engine and explain its working principle along with port timing diagram.	[14M]
	b.	Explain the effect of Exhaust blow down loss due to gas exchange process on volumetric efficiency.	

3	a.	What is abnormal combustion? How does it occur in S I Engine? Explain the methods to control abnormal combustion.	[14M]
	b.	What are the different methods used in CI engines to create turbulence in the mixture?	

4	a.	Define flame speed and explain its importance in the design of SI engine combustion chamber.	[14M]
	b.	Describe the phenomenon of knocking and discuss different factors affecting the knocking phenomenon.	
	c.	Explain the rating of SI Engine fuels.	

5	a.	A two-stroke diesel engine has a bore of 110 mm and stroke of 150 mm running at a mean speed of 5m/s, it develops a torque of 56.3 Nm. The mechanical efficiency of the engine is 80% and the indicated efficiency 40%. Assuming calorific value of fuel used 44800 KJ/Kg, determine, (i) the Ip, (ii) the indicated mep, and (iii) the fuel consumption per KWh of brake power	[14M]
	b.	Explain the significance of heat balance sheet in IC engine with help of one example.	

6	a.	Define frictional power (FP) in IC engine and explain retardation test method to determine FP.	[14M]
	b.	Following readings are obtained during a test on a single cylinder, four	

stroke I.C. engine:

Engine speed=300 rpm; diameter of orifice of the air tank=20 mm; pressure causing air flow through the orifice=100 mm of water column. Find the quantity of air consumed per second if the density under atmospheric conditions is 1.15kg/m^3. Take the coefficient of discharge for the orifice as 0.7

7   a. A single stage single acting reciprocating air compressor has air entering at **[14M]**
        1 bar, 20°C and compression occurs following polytropic process with
        index 1.2 upto the delivery pressure of 12 bar. The compressor runs at the
        speed of 240 rpm and has L/D ratio of 1.8. The compressor has mechanical
        efficiency of 0.88. Determine the isothermal efficiency and cylinder
        dimensions. Also find out the rating of drive required to run the
        compressor which admits 1 m3 of air per minute.
    b. Discuss the applications of compressed air to highlight the significance of
        compressors.

8   a. Describe the working of centrifugal compressors.   **[14M]**
    b. Explain the surging, choking effects in axial flow compressors

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R18

MALLA REDDY COLLEGE OF ENGINEERING & TECH~~NOLO~~GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular Examinations, February 2021
Introduction to Java Programming
(EEE, ME, ECE & AE)

Roll No										

Time: 2 hours 30 min   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1	a) Discuss the features of Object oriented programming details	**[9M]**
	b) Write a Java program to demonstrate Polymorphism	**[5M]**
2	a) Explain about method overloading and constructors? Explain with syntax and example program	**[9M]**
	b) Explain about method overriding	**[5M]**
3	What is inheritance? List different types of Inheritance? Explain about any three types of inheritance with example program	**[14M]**
4	a) Explain about abstract classes and methods with example program.	**[7M]**
	b) What is package and how to create a package	**[7M]**
5	a) Explain about user-defined exception handling with a Java program.	**[10M]**
	b) Write a program to demonstrate finally	**[4M]**
6	a)What is a thread and Explain about thread life cycle?	**[7M]**
	b)Write a program to demonstrate thread	**[7M]**
7	a) Explain about Applet and life cycle of an applet	**[10M]**
	b) Compare the differences between applets and applications	**[4M]**
8	a) Explain various layout managers. Explain about grid and flow layout with program	**[10M]**
	b) Explain about Swings	**[4M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECH R18 **GY**
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular Examinations, February 2021
Machine Design – I
(ME)

Roll No										

Time: 2 hours 30 min   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
***
NOTE: Design data books are permitted.

1   What are the desirable mechanical properties of metals? Explain about it briefly   **[14M]**

2   Consider the state of stress at a point of a bi-axially loaded member   **[14M]**
      as shown in the Figure1. Determine the principal stresses and
      calculate the factor of safety using.
      a) Maximum principal stress theory
      b) Maximum shear stress theory
      c) Maximum distortion energy theory
      Take the value of critical stress of the material as 300 N/mm²]
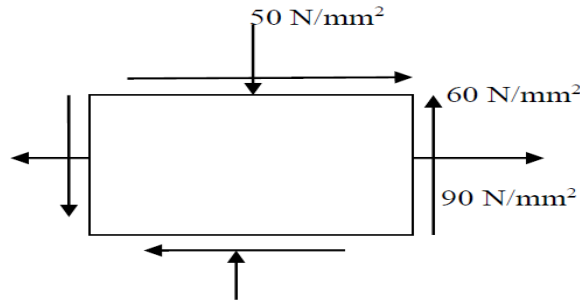

Figure 1

3   a) Draw S-N diagrams for ferrous and non ferrous materials?   **[7M]**
      b) A rod is subjected to a variable axial load which varies from -300 to 900 N. If   **[7M]**
      the endurance limit and the yield point of the material are 200 and 350 N/mm²,
      respectively, determine the diameter of the rod, using a factor of safety of 3

4   A machine component is subjected to a flexural stress which fluctuates between   **[14M]**
      + 300 MN/m2 and – 150 MN/m².
      Determine the value of minimum ultimate strength according to
      1. Gerber relation;
      2. Modified Goodman relation; and
      3. Soderberg relation.
      Take yield strength = 0.55 Ultimate strength;
      Endurance strength = 0.5 Ultimate strength; and factor of safety = 2.

5   a) State the assumptions made in the design of welded joint   **[4M]**

b) Design a double riveted butt joint with two cover plates for the longitudinal **[10M]** seam of a boiler shell 1.5m 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.

6   Design the longitudinal joint for a 1.25 m diameter steam boiler to carry a steam **[14M]** pressure of 2.5 N/mm^2. The ultimate strength of the boiler plate may be assumed as 420 MPa, crushing strength as 650 MPa and shear strength as 300 MPa. Take the joint efficiency as 80%. Sketch the joint with all the dimensions. Adopt the suitable factor of safety.

7   a) Draw a neat sketches of the following: **[4M]**
       i) Sunk key ii) Gib head key iii) Woodruff key
    b) Design a cotter joint to transmit a load of 2 KN. Take allowable stress values in **[10M]** tension and shear as 70 N/mm^2 and 30 N/mm^2, respectively

8   a) Why a flexible coupling is called by that name? Explain with a sketch   **[6M]**
    b) Design a CI protective type flange coupling to transmit 15 KW at 900 rpm. The **[8M]** following permissible stresses may be used. Shear stress for shaft, bolt and key=40 MPa. Crushing stress for bolt and key =80 MPa, shear stress for C.I. = 8 MPa, Draw a neat sketch of the coupling

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R18

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, April 2023
Managerial Economics & Financial Analysis
(ME &AE)

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.

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SECTION-I

1   What is demand forecasting? Explain the factors involved in demand forecasting.   **[14M]**

OR

2   Discuss the Micro and Macroeconomics significance on managerial economics on decision making?   **[14M]**

SECTION-II

3   Explain in detail both internal and external economies of scale and their respective Causes   **[14M]**

OR

4   Determine P/V Ratio %, Fixed Cost and BEP with the help of following Information: **[14M]**

Description	2014-15	2015-16
Sales (Rs.)	200000	1000000
Profits (Rs.)	25000	225000

SECTION-III

5   *A*   Write about various types of pricing.   **[4M]**

   B   Define Joint Stock Company What are the characteristics of a joint stock company?   **[10M]**

OR

6   *A*   Interpret different types of companies.   **[4M]**

   B   Explain the features of partnership.   **[10M]**

SECTION-IV

7   *A*   Write the significance of capital?   **[4M]**

   B   Explain the advantages and disadvantages of partnership firm   **[10M]**

OR

8   *A*   Discuss the features of working capital?   **[4M]**

   B   Write about accounting concepts and conventions?   **[10M]**

SECTION-V

9   *A*   Explain about payback period?   **[4M]**

   B   The cost of a project is Rs. 2,40,000 and the annual cash inflows for the next five years are Rs.60,000. What is the Payback period for the project?   **[10M]**

OR

10   *A*   Write about techniques of capital budgeting   **[4M]**

B   List and identify formula for Net Present Value and Profitability Index   **[10M]**

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R18

MALLA REDDY COLLEGE OF ENGINEERING & TECH~~OLO~~GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, April 2023
Computer Integrated Manufacturing Technologies
(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	A	Explain the chip formation process	**[4M]**
	B	What are the different types of chips? Explain	**[10M]**

OR

2	A	Write a short note of coolants are necessary in machining	**[7M]**
	B	Explain different types of lathe machine turning operations	**[7M]**

SECTION-II

3	A	Define the following boring operations.	
		(i) Facing	**[2M]**
		(ii) Counter Boring	**[2M]**
		(iii) Counter Sinking	**[2M]**
		(iv) Trepanning	**[2M]**
	B	What is a jig boring machine? With a neat sketch, describe its constructional features and working in detail.	**[6M]**

OR

4	A	Explain the working principle of slotting machine with a neat sketch	**[10M]**
	B	Explain any two slotting machine operations	**[4M]**

SECTION-III

5	A	Define the following geometry statements of Automatically Programmed Tolling language.	
		i) Points	**[2M]**
		ii) Lines	**[2M]**
		iii) Planes	**[2M]**
		iv) Circles	**[2M]**
	B	Define the following geometry statements of Automatically Programmed Tolling language.	
		i) Vectors	**[2M]**
		ii) Patterns	**[2M]**
		iii) Matrices	**[2M]**

OR

6	A	What are the basic elements of NC? Explain the advantages of NC system.	**[7M]**
	B	What is tool pre-setting? How to pre-set the tool in NC machining centre?	**[7M]**

SECTION-IV

7	A	Explain the components Used in DNC Machine and Types of DNC systems	**[10M]**
	B	What are the Functions of DNC System	**[4M]**

| 8 | A | Differentiate Feed forward adaptive control and Feedback adaptive control | **[9M]** |
| | B | Depict the Advantages of DNC System | **[5M]** |

SECTION-V

| 9 | A | Briefly explain the need for computer-aided process planning. | **[7M]** |
| | B | What is the difference between retrieval and generative type of computer - aided process planning? | **[7M]** |

| 10 | A | Explain briefly how Artificial Intelligence can be integrated in CAD Technology. | **[7M]** |
| | B | What are expert systems? Explain the characteristics and capabilities of the expert systems. | **[7M]** |

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R18

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, April 2023
Design of Hydraulic Pneumatic Systems
(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   *A*   Describe primary function of hydraulic fluid and properties of hydraulic fluid?   **[7M]**

   B   Explain positive displacement pump and non-positive displacement pump?   **[7M]**

OR

2   *A*   Explain the working of internal gear pump with neat sketch.   **[7M]**

   B   Describe the sources of hydraulic power?   **[7M]**

SECTION-II

3   *A*   Explain any one hydraulic cylinders with neat sketch?   **[7M]**

   B   What is a semi-rotary actuator and explain any one with neat sketch?   **[7M]**

OR

4   *A*   Explain detail about selection, specification and characteristics of linear Rotary Actuators?   **[7M]**

   B   What is meant by hydraulic cushioning? Explain with neat diagram.   **[7M]**

SECTION-III

5   *A*   Describe the applications of accumulators.   **[7M]**

   B   Describe synchronizing hydraulic cylinders with neat sketch?   **[7M]**

OR

6   *A*   Explain regenerative circuit with neat sketch?   **[7M]**

   B   Explain the working of mechanical hydraulic servo systems?   **[7M]**

SECTION-IV

7   *A*   Explain the design of pneumatic circuit with neat sketch?   **[7M]**

   B   Explain the working principle of a muffler with neat sketch?   **[7M]**

OR

8   *A*   Explain the working of pneumatic actuators with neat sketch?   **[7M]**

   B   Explain the working principle of electro pneumatic system?   **[7M]**

SECTION-V

9   *A*   Discuss the design of Pneumatic circuits for Pick and Place applications?   **[7M]**

   B   Explain the design of hydraulic circuits for surface grinding?   **[7M]**

OR

10   *A*   Describe the selection, installation, and maintenance of Hydraulic and Pneumatic systems?   **[7M]**

    B   Discuss tool handling in CNC Machine tools?   **[7M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECH̲ ̲GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, April 2023
Internal Combustion Engines
(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 **A** Discuss about Time Loss Factor, Heat Loss Factor, Exhaust Blow down-Loss? **[7M]**

 B What is an air standard cycle and define its efficiency? Also discuss the role of volumetric efficiency in CI engine? **[7M]**

OR

2 **A** Explain the differences between SI and CI engines? **[7M]**

 B How are the injection system classified in C.I Engines? Describe them briefly with neat sketches? **[7M]**

SECTION-II

3 **A** What are the different methods used in CI engines to create turbulence in the mixture? Explain its effect on power output and thermal efficiency of the engine? **[7M]**

 B With neat sketch, explain the differences in knocking phenomenon of SI and CI Engines? **[7M]**

OR

4 **A** Explain the Phenomenon of Combustion in CI engine with neat sketch? Also explain the stages of combustion in CI engine? **[7M]**

 B What is the difference between 'swirl' in C.I. engine and 'turbulence' of S.I. engine? Describe with neat sketch? **[7M]**

SECTION-III

5 **A** The following data refers to a test on a single cylinder oil engine working on Four Stroke Cycle. Diameter of brake wheel and rope diameter : 60 cm and 3 cm Dead load and spring balance reading : 250 N and 50 N Bare and piston stroke : 10 cm and 15 cm Speed of Engine : 400 rev/min Length and area of indicator diagram : 6 cm and 4 cm^2 Spring stiffness : 12 N/cm^2 per cm Fuel consumption : 0.32 kg/kWh Calorific value of fuel : 43950 kJ/kg Determine brake power, indicated power, mechanical efficiency and indicated thermal efficiency of the engine? **[7M]**

 B A six-cylinder four-stroke, direct-injection oil engine is to deliver 120 kW at 1600 rpm. The fuel to be used has a calorific value of 43 MJ/kg and its percentage composition by mass is carbon 86%, hydrogen 13%, and non combustibles 1%. The absolute volumetric efficiency is assumed to 80%, the indicated thermal efficiency 40% and the mechanical efficiency 80%. The air consumption to be 110% in excess of that required for theoretically correct **[7M]**

co combustion. i) Estimate the volumetric composition of dry exhaust gas and ii) Determine the bore and stroke of the engine, taking a stroke to bore ratio as 1.5. Assume the volume of 1 kg of air at the given conditions as 0.77m^3

OR

6 In a test on diesel engine under full load conditions, the following results were obtained: IP = 33 kW; BP=27 kW; fuel consumed: 8kg/hr; air fuel ratio: 20; Cooling water flow rate: 10 kg/min; temperature drop of cooling water: 60°C; Exhaust gas temperature: 450°C; room temperature: 15°C; Calorific value of fuel: 41MJ/kg, Calculate brake thermal efficiency, mechanical efficiency, specific fuel consumption, mean effective pressure and prepare a heat balance sheet. **[14M]**

SECTION-IV

7 **A** Calculate the diameter and stroke for a double acting single stage reciprocating air compressor of 50kW having induction pressure 100 kN/m^2 and temperature 150°C. The law of compression is $PV^{1.2}$ = C and delivery pressure is 500 kN/ m^2. The revolution/sec =1.5 and mean piston speed in 150 m/min. Clearance is neglected? **[7M]**

B Explain the working of 2 stage reciprocating air compressor with neat sketch. **[7M]**

OR

8 **A** An air compressor cylinder has 150mm bore and 150mm stroke and the clearance is 15%. It operates between 1 bar, 27°C and 5 bar. Take polytrophic exponent n=1.3 for compression and expansion processes find? **[7M]**
      i.   Cylinder volume at the various salient points of in cycle.
      ii.   Flow rate in m^3/min at 720 rpm and .
      iii.   The deal volumetric efficiency.

B A single acting reciprocating air compressor has cylinder diameter and stroke of 200 mm and 300 mm respectively. The compressor sucks air at 1 bar and 27°C and delivers at 8 bar while running at 100 r.p.m Find: 1. Indicated power of the compressor; 2. Mass of air delivered by the compressor per minute; and 3. temperature of the delivered by the compressor. The compression follows the law $PV^{1.25}$ = C Take R as 287 J/kg K. **[7M]**

SECTION-V

9 **A** Draw the velocity triangle of axial flow compressor and derive the expressions for work done factor - isentropic efficiency, and Polytropic efficiency? **[9M]**

B Describe various losses associated with the dynamic compressors? **[5M]**

OR

10 **A** Explain the working principle of axial flow compressor with neat sketch? **[8M]**
B Write short note on the following:
      i)   Choking and Stalling. **[2M]**
      ii)   Slip factor and power input factor. **[2M]**
      iii)   Polytrophic efficiency **[2M]**

***

R18

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, April 2023
Introduction to Java Programming
(EEE, ME, ECE & AE)

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	**A**	Explain any five object oriented features supported by java with examples. Explain about Object class in detail.	**[9M]**
	B	Write a Java Program for swapping of two numbers without using third variable	**[5M]**

OR

2	**A**	Is Java a robust language? Justify your answer? Differentiate between a class and object.	**[7M]**
	B	Explain briefly about type conversion and type casting with example program?	**[7M]**

SECTION-II

3	**A**	Write a runtime polymorphism program in Java by using interface reference variable	**[7M]**
	B	Discuss about anonymous inner classes. With suitable code segments illustrate various uses of 'final' keyword.	**[7M]**

OR

4		What is inheritance? Explain different forms of inheritance with suitable program segments and real world example classes.	**[14M]**

SECTION-III

5	**A**	How to handle multiple catch blocks for a nested try block? Explain with an example.	**[7M]**
	B	Write a program that includes a try block and a catch clause which processes the arithmetic exception generated by division-by-zero error	**[7M]**

OR

6	**A**	Define Thread?Describe how to create a threads with an example	**[7M]**
	B	Does Java support thread priorities? Justify your answer with suitable discussion.	**[7M]**

SECTION-IV

7	**A**	Explain about passing parameters to an applet	**[9M]**
	B	Mention Various mouse and keyboard events?	**[5M]**

OR

8	**A**	Is Applet more secure than application program? Justify your answer	**[7M]**
	B	What is the role of event listeners in event handling? List the Java event listeners	**[7M]**

SECTION-V

9	*A*	Why swing components are preferred over AWT components?	**[7M]**
	B	Write an applet to display the mouse cursor position in that applet window	**[7M]**

OR

10	Classify various Layout Managers with examples.	**[14M]**

***

R18

MALLA REDDY COLLEGE OF ENGINEERING & TECH⬚GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, April 2023
Machine Design - I
(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	**A**	List out and explain any two theories of failure	**[6M]**
	B	A shaft is subjected to bending moment that varies from +400 N-m to -200 N-m and a twisting moment at the critical section varies from 300 N-m clockwise to 100 N-m counter clockwise. Determine the shaft diameter, assuming the stress values and the other needed information	**[8M]**

OR

2	**A**	What are the desirable mechanical properties of metals?	**[7M]**
	B	Explain about the mechanical properties of metalsbriefly	**[7M]**

## SECTION-II

3	**A**	Explain stress concentration	**[4M]**
	B	Find the diameter of a shaft made of 37 Mn 2 steel having the ultimate tensile strength as 600 MPa and yield stress as 440 MPa. The shaft is subjected to completely reversed axial load of 200 kN. Neglect stress concentration factor and assume surface finish factor as 0.8. The factor of safety may be taken as 1.5	**[10M]**

OR

4	**A**	Determine the thickness of a 120 mm wide uniform plate for safe continuous operation if the plate is to be subjected to a tensile load that has a maximum value of 250 kN and a minimum value of 100 kN. The properties of the plate material are endurance limit stress 225 MPa and Yield point stress 300 MPa. The factor of safety based on yield point may be taken as 1.5	**[10M]**
	B	What information do you obtain from Gerber's curve,?	**[4M]**

SECTION-III

5	**A**	State the assumptions made in the design of Bolted joint	**[4M]**
	B	A bracket is bolted to a column by 6 bolts of equal size as shown in figure. It carries a load of 50 kN at a distance of 150 mm from the centre of column. If the maximum stress in the bolts is to be limited to 150 MPa, determine the diameter of bolt. (All dimensions are in mm)	**[10M]**
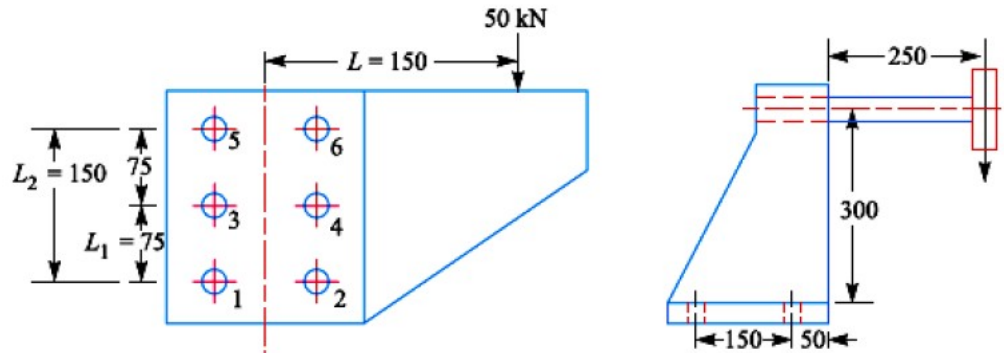
<center>OR</center>

6 **A** State the differences between permanent and temporary joints **[7M]**

B Two lengths of mild steel flat tie bars 200 mm × 10 mm are to be connected by a double riveted double cover butt joint, using 24 mm diameter rivets. Design the joint, if the allowable working stresses are 112 MPa in tension, 84 MPa in shear and 200 MPa in crushing. **[7M]**

<center>

SECTION-IV</center>

7 **A** What is the function of key? How are the keys classified? **[4M]**

B Draw neat sketches of different types of keys and state their applications. What are the considerations in the design of dimensions of formed and parallel key having rectangular cross-section? **[10M]**

<center>OR</center>

8 **A** Explain knuckle joint importance? **[2M]**

B Two mild steel rods 40 mm diameter are to be connected by a cotter joint. The thickness of the cotter is 12 mm. Calculate the dimensions of the joint, if the maximum permissible stresses are: 46 MPa in tension ; 35 MPa in shear and 70 MPa in crushing **[12M]**

<center>

SECTION-V</center>

9 **A** Explain Flange couplingwith a sketch **[4M]**

B A mild steel shaft transmits 20kW at 200 r.p.m. It carries a central load of 900 N and is simply supported between the bearings 2.5 m apart. Determine the size of the shaft, if the allowable shear stress is 42 MPa and the maximum tensile or compressive stress is not to exceed 56 MPa. What size of the shaft will be required if it is subjected to gradually applied loads?
    (Take Km = 1.5 and Kt = 1) **[10M]**

<center>OR</center>

10 **A** Differentiate solid shaft and hallow shaft. **[4M]**

B A steel spindle transmits 4 kW at 800 r.p.m. The angular deflection should not exceed 0.25° per metre of the spindle. If the modulus of rigidity for the material of the spindle is 84 GPa, find the diameter of the spindle and the shear stress induced in the spindle. **[10M]**

<center>***</center>

Code No: **R18A0553**

RA

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, Dec-21/Jan-22
Data Structures Using Python
(ME& AE)

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 a) Explain how to assign values to multiple variables. What are the rules and Naming Convention for Variables and constants? **[7M]**

b) Write a Python Program to given two integer numbers return their product. If the product is greater than 1000, then return their sum. **[7M]**

OR

2 a) List the various operators in Python. Discuss about the precedence and associativity of Python operators. **[7M]**

b) Write a Python Program to take a given string as input, display only those characters which are present at an even index number. **[7M]**

SECTION-II

3 a) What is if...elif…else statement in Python? Provide the flow chart and syntax on how to use an if..elif..else statement. **[7M]**

b) Write a Python program to extract each digit from an integer, in the reverse order. **[7M]**

OR

4 a) What is an array in Python? Explain how the arrays support negative indexing in Python. **[7M]**

b) (i) Write a Python Program to reverse the elements of an array.
(ii) Write a Python program that count of the occurrence of an element. **[7M]**

SECTION-III

5 a) Discuss the different types of arguments that can be passed in calling functions. **[7M]**

b) (i) Develop Python code to produce the sum of digits of a given number.
(ii) Write a Python program to print a person is eligible to vote or not given his/her age. **[7M]**

OR

6 a) What is an anonymous function? Describe how the anonymous function is different from Lambda function. **[7M]**

b) Write a Python program to check whether an n-digit integer is a palindrome number or not. **[7M]**

SECTION-IV

7 a) What are the different collections of Python? How to use a list in Python and perform slicing of elements in a list? **[7M]**

b) Write a Python program to perform various operations on a list of elements in

Python. [7M]

<div align="center">OR</div>

8   a) Define a dictionary. Explain how a dictionary can be used in collecting   [7M]
elements in Python.

b) Discuss various methods used in Dictionary and also explain how dictionary
comprehension is performed in Python. [7M]

<div align="center">

SECTION-V

</div>

9   a) Explain how quick sort algorithm can be used to sort the elements in a list.   [7M]

b) Write a Python program to sort the elements of a list using quick sort technique.   [7M]

<div align="center">OR</div>

10   a) What is the working principle of a queue? Write a Python program to use a list   [7M]
to create a Python queue.

b) List the various applications of queue. Develop a Python program to
demonstrate the various operations on queue. [7M]

<div align="center">**********</div>

MALLA REDDY COLLEGE OF ENGINEERING & TECH **R18** GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular/Supplementary Examinations, Dec-21/Jan-22
Introduction to Java Programming
(EEE, ME, ECE & AE)

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 a. Differentiate between Object Oriented Programming with Procedural **[7M]**
       concepts? and explain the applications of OOPs.
    b. Explain the Java Buzzwords. **[7M]**

OR

2 What is the significance of Java's byte code?, and Explain the concept of **[14M]**
   Abstraction and Encapsulation.

SECTION-II

3 How to create and use a package in Java program? Explain various access **[14M]**
   specifiers supported by Java with an example

OR

4 Explain the various types of Inheritance with suitable examples. "Java is called **[14M]**
   Machine Independent language" - Justify this statement with proper explanation

SECTION-III

5   **[7M]**
                                                                              [7M]

    a. How to create a threads and explain with a suitable example
    b. Explain thread life cycle with neat sketch.

OR

6   **[14M]**

   Explain about Exception Handling in Java with examples.

SECTION-IV

7 Explain the Applet life cycle with suitable examples. **[14M]**
OR

8   **[7M]**
                                                                                   [7M]

   a)   Differentiate between Character and Byte streams and

   b)   Write a Java program to display the contents of a given file.

SECTION-V

9   Explain in detail about AWT class hierarchy with all related classes.   **[14M]**

                                     OR

10 Discuss different Layout managers with suitable examples.   **[14M]**

<div align="center">**********</div>

Code No: **R18A0061**
MALLA REDDY COLLEGE OF ENGINEERING & TECH | **R18** | GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular/Supplementary Examinations, Dec-21/Jan-22
Managerial Economics Financial Analysis
(ME&AE)

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	Define Managerial Economics. Explain its Nature And Scope of managerial Economics.	**[14M]**

OR

2	Define the 'Demand' and explain the factors that influence the demand of a product.	**[14M]**

SECTION-II
3	a. Define the Break-Even analysis and outline its limitations.	**[7M]**
	b. The information about Raj and Co., are given below.	**[7M]**

i) Profit-Volume Ratio (P/V Ratio) is 20%
ii) Fixed costs Rs. 36000
iii) Selling price per Unit Rs. 150
b) Calculate:
i) BEP (in Rs.)
ii) BEP (in Units)
iii) Variable Cost per Unit
iv) Selling Price per Unit

OR

4	Define 'Cost'. How are costs classified? Explain any five important cost concepts useful for managerial decisions	**[14M]**

SECTION-III
5	a) What are the different types of Business organizations?	**[7M]**
	b) What are the features of Sole trading form of Organization	**[7M]**

OR

6	Compare and contrast between Perfect competition and Monopoly, and its features.	**[14M]**

SECTION-IV
7	Define working capital, What factors determine the working capital requirements of company?	**[14M]**

OR

8	Define the concepts of 'Accounting', Financial Accounting and Accounting and its salient functions.	**[14M]**

9 Discuss the importance of Ratio Analysis for inter firm and intra-firm   **[14M]**
Comparison, including circumstances responsible for its limitations, if any.

OR

10 Conceder the case of the company with the following two investment alternatives   **[14M]**
each costing Rs.9 lakhs. The details of the cash inflows;

Year	Rs.in Lakhs Project-1	Rs.in Lakhs Project-2
1	3	6
2	5	4
3	6	3

The cost of capital is 10% per year. Which project will you choose under
NPV method?

****

R18

MALLA REDDY COLLEGE OF ENGINEERING & TECH▨▨GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular/Supplementary Examinations, Dec-21/Jan-22
Computer Integrated Manufacturing Technologies
(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 the Geometry of single point tool and angles with neat sketches and also influence of each parameter on machining process   **[14M]**

OR

2   Describe the Lathe working principle, specifications of lathe and its operations with neat sketches   **[14M]**

SECTION-II

3   a) Classify the various drilling machines with brief notes of each one   **[7M]**
     b) Write the specific operations performed on each variety of drilling machine   **[7M]**

OR

4   a) Describe the various work holding and tool holding devices of Planning Machine   **[7M]**
     b) Explain various operations performed on Planning Machine   **[7M]**

SECTION-III

5   Distinguish between point-to-point control and continuous path control in NC system.   **[14M]**

OR

6   a) Describe the axis representation system used for CNC Milling machines.   **[7M]**
     b) Discuss the various interpolation methods used in NC machines.   **[7M]**

SECTION-IV

7   a) Define NC, CNC and DNC machine. List advantages of CNC machine over NC   **[7M]**
     b) Discuss the NC and CNC Machine applications   **[7M]**

OR

8   a)Explain the application and advantages of integration of CAQC with CAD/CAM systems   **[7M]**
     b)Discuss the objectives of CAQC. Explain the different computer aided inspection methods.   **[7M]**

SECTION-V

9   Briefly explain the need of CAPP (Computer Aided Process Planning)   **[14M]**

OR

10   Explain any one method of feature recognition approaches in CAPP with example.   **[14M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular/Supplementary Examinations, Dec-21/Jan-22
Design of Hydraulic Pneumatic Systems
(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   a) State Pascal's law and Explain in details about the application of Pascal's law   **[7M]**
with neat sketch**.**

b) Explain with neat sketch about working principle of basic hydraulic system and   **[7M]**
pneumatic system

OR

2   Design the hydraulic circuit and explain with neat sketch for the application of   **[14M]**
hand operated hydraulic jack

SECTION-II

3   List the components used in the hydraulic systems and sketch the ANSI symbol of   **[14M]**
all the components in the hydraulic systems.

OR

4   Explain with neat sketch about spring loaded pressure relief valve and pressure   **[14M]**
reducing valve.

SECTION-III

5   a) Design and explain the working of a regenerative circuit.   **[7M]**
b) Explain the working principle of pressure intensifier, with neat diagram.   **[7M]**

OR

6   Describe a hydraulic circuit for synchronizing two cylinder with flow control   **[14M]**
valves

SECTION-IV

7   Define compressor. Explain the working principle of piston type compressor and   **[14M]**
screw type compressor with neat sketch.

OR

8   With a neat sketch of the pneumatic filter and explain its construction and working   **[14M]**
of cartridge filter.

SECTION-V

9   Design and draw a circuit using the hydraulic components for the Drilling   **[14M]**
operation.

OR

10 Explain in detail about how the failure and trouble shooting is carried out in   **[14M]**
hydraulic system.

****

Code No: **R18A0313**

R18

MALLA REDDY COLLEGE OF ENGINEERING & TECH___GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular/Supplementary Examinations, Dec-21/Jan-22
Internal Combustion Engines
(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 a) Compare the actual and fuel air cycles of a gasoline engine (IC Engine)   **[7M]**
     b) Briefly explain the following   **[7M]**
        (i) Time loss factor (ii) heat loss factor (iii) Spark advance

OR

2 a) Explain the knocking phenomenon in SI engines.   **[7M]**
     b) Explain the various types of combustion chambers used in SI engines with figures. **[7M]**
SECTION-II
3 a) Discuss the various methods for measurement of brake power?   **[7M]**
     b) Explain the working of fuel injection system of CI engine.   **[7M]**

OR

4 a) Draw the line diagram and explain typical fuel feed system for a CI engine.   **[7M]**
     b) Determine the process of evaluating indicated power of an IC engine by using   **[7M]**
     Morse Test.
SECTION-III
5 A 4 cylinder, gasoline engine operates on 4 stroke cycle. The bore of each cylinder **[14M]**
     is 90 mm and the stroke is 110 mm. The clearance volume per cylinder is 60 C.C.
     At a speed of 3500 RPM, the fuel consumption is 18 kg/hr and the torque
     developed is 140 N-m. Calculate i) Brake power ii) Bmep iii) Brake thermal
     efficiency if the calorific value of the fuel is 42,000 kJ/kg iv) relative efficiency on
     a brake power basis assuming the engine works on the constant volume cycle.

OR

6 A six cylinder, four stroke petrol engine having a bore of 90mm and stroke of   **[14M]**
     100mm has a compression ratio of 7. The relative efficiency with reference to
     indicated thermal efficiency is 55% when the indicated specific fuel consumption
     is 0.3 kg/kWh. Estimate the calorific value of fuel and fuel consumption (in kg/h),
     given that the imep is 8.5bar and speed is 2500rpm.
SECTION-IV
7 a) Explain the concept of stalling and losses of axial flow compressor.   **[7M]**
     b) Compare rotary compressors and reciprocating compressors.   **[7M]**

OR

8 20 m^3 of air per second at 1 bar 15^{0}C is to be compressed in a centrifugal compressor **[14M]**
     through a pressure ratio of 1.5:1. The compression follows the law $PV^{1.5}$ = constant.

The velocity of flow at inlet and out let remains constant and is equal to 60 m/s. If the inlet and outlet impeller diameters are 0.6 m and 1.2 m respectively and rotates at a speed of 5000 rpm. Find (i) the blade angles at inlet and outlet of the impeller, and the angle at which the air from the impeller enters the casing; (ii) breadth of impeller blade at inlet and outlet.

SECTION-V

9 a) With help of a neat sketch explain the construction and working of an axial flow compressor.　**[7M]**

b) Draw the velocity triangles for the centrifugal compressor and derive the equation for the estimation of power required to compress the air.　**[7M]**

OR

10 A single-acting two stage air compressor delivers air at 18 bar. The temperature and pressure of the air before the compression in LP cylinder are 25^0C and 1 bar. The discharge pressure of LP cylinder is 4.2 bar. The pressure of air leaving the intercooler is 4 bar and the air is cooled to 25^0 C. The diameter and stroke of LP cylinder are 40 cm and 50 cm respectively. The clearance volume is 5% stroke in both cylinders. The speed of the compressor is 200 rpm. Assuming the index of compression and re-expansion in both the cylinders as 1.25 , Cp for air = 1.004 kJ/kgK, find　**[14M]**

(i) Power required to run the compressor and

(ii) Heat rejected in intercooler/min

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R18

MALLA REDDY COLLEGE OF ENGINEERING & TECHNO
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Regular/Supplementary Examinations, Dec-21/Jan-22
Machine Design – I
(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 a) Explain the design considerations for the selection of Engineering Materials and their properties?   **[8M]**

b) Explain the concept of stiffness in tension, bending, torsion and combined situations?   **[6M]**

OR

2 a) Find the diameter of shaft required to transmit 60 kW at 150 rpm if the maximum torque is likely to exceed the mean torque by 25% for a maximum permissible torsional shear stress of 60 N/mm2. Also find the angle of twist for a length of 2.5 meters. Take G = 80 GPa.   **[10M]**

b) A cast iron pulley transmits 10 KW at 400 rpm. The diameter of the pulley is 1.2 meter 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.   **[4M]**

SECTION-II

3 a) Describe the Goodman's line theory for designing the components subjected to fatigue loads?   **[8M]**

b) A thin wall cylindrical pressure vessel of mean diameter of 60 cm is subjected to internal pressure varying from 0 to 40 MPa. Find the required thickness of the pressure vessel based on yield point of 400 MPa, endurance limit of 22 Mpa, and a factor of safety of 3. Use Soderberg criterion of failure.   **[6M]**

OR

4 A steel rod is subjected to a reversed axial load of 180 kN. Find the diameter of the rod for a factor of safety of 2. Neglect column action. The material has an ultimate tensile strength of 1070 Mpa and yield strength of 910 Mpa. The endurance limit is reversed bending may be assumed to be one half of the ultimate tensile strength. The correction factors are as follows.   **[14M]**
Load factor = 0.7; surface finish factor = 0.8
Size factor = 0.85; stress concentration factor = 1.

SECTON-III

5 a) Explain with sketches the different types of failures and efficiencies of the riveted joints   **[4M]**
                                                                               [10M]
b) Explain the design procedure for the eccentrically loaded welded joint.

<div align="center">OR</div>

6   Design a triple riveted longitudinal butt joint with unequal cover plates for a boiler   **[14M]**
seam. The diameter of the boiler is 2 m and the internal pressure is 2 MPa. The
working stresses are 70 MPa in tension, 50 MPa in shear and 120 MPa in
compression and the required efficiency of the joint is 80%.

<div align="center"><u>**SECTION-IV**</u></div>

7   Design a sleeve and cotter joint to resist a tensile load of 60 KN. All parts of the   **[14M]**
joint are made of the same material with the following allowable stresses. σ_t = 60
MPa , τ = 70 MPa and σ_c =125 MPa.

<div align="center">OR</div>

8   Design a cotter joint to support a load varying from 30KN in compression to 30KN   **[14M]**
in tension. The material used is carbon steel for which the following allowable
stresses may be used. The load is applied statically. Tensile stress = compressive
stress = 50MPa; shear stress = 35MPa and crushing shear stress = 90MPa.

<div align="center"><u>**SECTION-V**</u></div>

9   a) Write short notes on flexible couplings.   **[7M]**
b) The bolt in the flange coupling should be made weaker than the other   **[7M]**
components of coupling? Why?

<div align="center">OR</div>

10   Design a bushed pin type flexible coupling for connecting a motor shaft to a pump   **[14M]**
shaft for the following service conditions. Power to be transmitted = 40 kW, speed
of the motor shaft = 1000 rpm. The material properties are : i) The allowable shear
and crushing stress for shaft and key material is 40 MPa and 80 MPa respectively,
ii) allowable shear stress for cast iron is 15 MPa, iii) Allowable bearing pressure
for rubber brush is 0.8 N/mm^2 and iv) the material of the pin is same as that of shaft
and key. Draw neat sketch of the coupling.

<div align="center">************</div>

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, January 2024
Managerial Economics & Financial Analysis
(ME & AE)

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	*A*	Define Managerial Economics. Explain its nature.	**[7M]**
	B	What are macroeconomic concepts? Explain.	**[7M]**

OR

2	*A*	Describe the Law of Demand concept.	**[7M]**
	B	Write about methods of demand forecasting.	**[7M]**

SECTION-II

3	*A*	Distinguish between Isocost and Isoquants.	**[7M]**
	B	Elucidate the concept of Break Even Analysis with an example.	**[7M]**

OR

4	*A*	Illustrate the Cob-Douglas production function.	**[7M]**
	B	What is the Least cost combination of Inputs? Explain.	**[7M]**

SECTION-III

5	*A*	Define the term Market. State the features of perfect competition.	**[7M]**
	B	What is the difference between monopolist and monopolistic competitive?	**[7M]**

OR

6	*A*	Write about the following	**[7M]**

   a. Sole Trader
   b. Partnership

	B	Explain the objectives of pricing.	**[7M]**

SECTION-IV

7	*A*	Describe the methods and sources of raising funds.	**[7M]**
	B	From the following transactions prepare journal in the books of Avinash & co 2008:	**[7M]**

May 1 commenced business with Rs 1, 00,000/-
May 5 purchase goods from rahul & co with Rs 10,000/-
May 7 sold goods worth Rs 20,000/-
May10 salaries paid Rs 15,00/-
May 11 purchased stationary worth Rs 1000/-
May 15 Bought furniture worth Rs 20000/-
May 18 cash deposited into bank Rs 9000/-
May 20 Paid wages Rs 5000/-
May 24 cash withdrawn from bank Rs 3000/-
May 28 paid rent by cheque Rs 1800/-

OR

8	*A*	Define accounting and write the importance, limitations & process of accounting	**[7M]**
	B	What is the need for capital for the business? Explain.	**[7M]**

SECTION-V

9	*A*	What is capital budgeting? Explain the techniques of Capital Budgeting	**[7M]**
	B	Explain briefly Net Present Value technique of capital budgeting.	**[7M]**

OR

10	*A*	Explain briefly the pay back technique of capital budgeting.	**[7M]**
	B	How do you interpret current ratio liquidity?	**[7M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, January 2024
Computer Integrated Manufacturing Technologies
(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.

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SECTION-I

1	A	Different various tool angles used in single point cutting tools with a neat sketch?	[7M]
	B	Explain the use of merchents circle diagram ?explain the diagram indicating cutting forces?	[7M]

OR

2	A	What are various work holding devices in a lathe & explain with a neat sketches?	[7M]
	B	How CNC machine works and give advantages and limitations?	[7M]

SECTION-II

3	A	With the help of line diagram ,explain the basic principle ,construction details and working of a shaper?	[7M]
	B	What are the tool holding devices in boring and drilling?	[7M]

OR

4	A	Differentiate among shaping ,planning and slotting machines with regard to construction and working?	[7M]
	B	Explain about drilling and boring operations? And explain deep hole drilling machine with a neat sketch?	[7M]

SECTION-III

5	A	Discuss the four types of statements used in APT part programming.	[7M]
	B	Explain preset& Qualified tools in CNC machining?	[7M]
6	A	State the advantages and disadvantages of Numerical Control.	[7M]
	B	Explain the quick-change tooling system& Automatic tool changing system?	[7M]

SECTION-IV

7	A	Explain the Concept of adaptive control of NC Machines?	[7M]
	B	What are the types of DNC Systems (BTR & Machine control unit)?	[7M]

OR

8	A	Briefly Explain CNC and DNC Systems Functions?	[7M]
	B	What is a CNC Post Processor & Explain the structure of Post processor?	[7M]

SECTION-V

9	A	Define computer aided quality control. Explain how it is implemented?	[7M]
	B	With a neat sketch Explain the Variant and generative types approach CAPP systems?	[7M]

OR

| 10 | A | Explain with a neat sketch of Coordinate Measuring Machine& Types of CMM? | [7M] |
| | B | Explain any two types Contact and Non-Contact inspection methods? | [7M] |

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, January 2024
Design of Hydraulic and Pneumatic Systems
(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.

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SECTION-I

1 *A* Explain the working principle of axial piston pumps with neat sketch   **[7M]**
     B Explain the Pascal's Law with the equation   **[7M]**

OR

2 *A* What are the types of piston pump? Explain the working principle of any one with help of neat sketch   **[10M]**
     B Write short notes about types of fluids used in the fluid power systems   **[4M]**

SECTION-II

3 *A* Explain the working principle following types of cylinders i) Single acting cylinder ii) Double acting cylinder   **[10M]**
     B Describe the term cylinder cushioning.   **[4M]**

OR

4 *A* Explain the working principle semi-rotary actuator with neat sketch..   **[7M]**
     B Explain the working principle of different types of cylinders used in hydraulic system   **[7M]**

SECTION-III

5 *A* What are hydraulic accumulators? Sketch and explain dead weight accumulator   **[7M]**
     B Discuss the construction and working of a Mechanical hydraulic servo system with a diagram   **[7M]**

OR

6 *A* Draw and explain the Air-over-oil circuit used in the hydraulic circuit.   **[7M]**
     B What is the function of pressure intensifier?   **[7M]**

SECTION-IV

7 *A* Sketch the graphical symbol and Explain the construction and working principle of FRL Unit with neat sketch.   **[10M]**
     B Discuss the function of an air filter   **[4M]**

OR

8 *A* Describe pneumatic Actuators and explain the types of linear Actuators.   **[7M]**
     B Explain the construction and operation of quick exhaust valve with neat sketch   **[7M]**

SECTION-V

9 *A* Draw and explain a pneumatic system to pick and place operation.   **[7M]**
     B Design and draw a circuit using the hydraulic components for the Drilling operation.   **[7M]**

OR

10 *A* Explain in detail about how the failure and troubleshooting is carried out in pneumatic system   **[10M]**
      B List any two common faults in hydraulic system.   **[4M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, January 2024
Internal Combustion Engines
(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.

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SECTION-I

1	A	Explain lubrication system for IC engines?	[7M]
	B	Sketch and explain the valve timing diagram of a four stroke Otto cycle?	[7M]

OR

2	A	Draw the valve timing diagram of a 4-stroke C.I Engine.	[7M]
	B	Differentiate between actual cycles and air standard cycles.	[7M]

SECTION-II

3	A	Differentiate between normal combustion and abnormal combustion phenomena in case of SI Engine.	[7M]
	B	What is the importance of variables like flame speed flame front in case of delay period?	[7M]

OR

4	A	Factors influencing knocking in SI and CI engine?	[7M]
	B	State and explain different combustion stages in SI engine?	[7M]

SECTION-III

5	A	Explain the Morse test?	[7M]
	B	Define the following terms: Indicated Power, Brake power, Friction Power, Mechanical efficiency, Mean effectiveness.	[7M]

OR

6	A	Discuss different types of dynamometers.	[7M]
	B	What is the significance of heat balance sheet? Discuss the procedure to draw heat balance sheet for CI engine?	[7M]

SECTION-IV

7	A single –stage, double-acting compressor has a free air delivery (FAD) of 14 m3 /min. measured at 1.013 bar and 15⁰C. The pressure and temperature in the cylinder during induction are 0.95 bar 32⁰ C. The delivery pressure is 7 bar and index of compression and expansion n=1.3. The clearance volume is 5 % of the swept volume. Calculate (i) Indicated power required (ii) Volumetric efficiency.	[14M]

OR

8	Derive the expression for the efficiency of reciprocating air compressor with p-V diagram.	[14M]

SECTION-V

9	A	Explain the work required for Multi-stage compressor?	[7M]
	B	Explain the working principle of axial flow compressor with a neat sketch.	[7M]

10   Air at 103 K Pa and 27^0 C is drawn in LP cylinder of a two stage air **[14M]** compressor and is isentropically compressed to 700 KPa. The air is then cooled at constant pressure to 37^0 C in an intercooler and is then again compressed isentropic ally to 4 MPa in the H.P cylinder, and is then delivered at this pressure Determine the power required to run the compressor if it has to deliver 30 m^3 of air per hour measured at inlet conditions.

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, January 2024
Introduction to Java Programming-
(EEE, ME, ECE & AE)

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.

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SECTION-I

1	**A**	Compare and contrast procedural and objectobject-orientedamming paradigms	**[5M]**
	B	Discuss Java buzzwords in detail.	**[9M]**

OR

2	**A**	Briefly discuss various operators in Java and provide examples of their use in expressions.	**[7M]**
	B	Define a constructor. How a constructor is different from a normal method? Explain different types of constructors in Java with suitable examples.	**[7M]**

SECTION-II

3	**A**	Discuss different types of inheritance in object oriented programming.	**[7M]**
	B	Define method overriding in Java. Provide an example demonstrating the implementation of method overriding.	**[7M]**

OR

4	**A**	Compare and contrast interfaces and abstract classes in detail.	**[6M]**
	B	Write steps to create and import a package with an example.	**[8M]**

SECTION-III

5	**A**	Demonstrate unchecked and checked exceptions with an example program.	**[4M]**
	B	Define an exception? Explain the need of exception handling in programming.	**[10M]**

OR

6	**A**	How to achieve synchronization among threads? Write suitable code	**[7M]**
	B	What is multithreading? Develop a Java program to create multiple threads.	**[7M]**

SECTION-IV

7	**A**	Discuss the applet life cycle with a neat diagram.	**[7M]**
	B	Illustrate the mechanism of handling keyboard events with an example program.	**[7M]**

OR

8	**A**	Explain the concept of adapter classes and their role in event handling with an example program.	**[7M]**
	B	Write a Java program to demonstrate the reading and writing of data to files.	**[7M]**

SECTION-V

9	**A**	Explain the concept of Layout Managers in AWT. Discuss different types of layout managers, such as Border Layout, Grid Layout, and Flow Layout.	**[8M]**
	B	What is the difference between swing and AWT?	**[6M]**

10   *A*   Write a Java program to create a login window using AWT in Java as   **[10M]**
follows and implementing an event to check whether the user credentials are
correct or not.:
User Id: ☐
Password: ☐

Login		Cancel

    B   What is the swings framework? Explain the motivation behind the   **[4M]**
development of Swing and how it addresses the limitations of AWT.

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R18

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, January 2024
Machine Design - I
(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.

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SECTION-I

1 **A** Write short notes on the following :   **[7M]**
(a) Interchangeability (b) Tolerance (c) Allowance (d) Fits

B If the base plate carries a load of 120 kN (including self-weight, which is   **[7M]**
equally distributed on the four corners), calculate the stress on the lower washers before the nuts are tightened. What could be the stress in the upper and lower washers, when the nuts are tightened so as to produce a tension of 5 kN on each bolt?

OR

2 **A** A mild steel rod of 12 mm diameter was tested for tensile strength with the   **[7M]**
gauge length of 60 mm. Following observations were recorded: Final length = 80 mm; Final diameter = 7 mm; Yield load = 3.4 kN and Ultimate load = 6.1 kN.
Calculate: 1. yield stress, 2. ultimate tensile stress, 3. percentage reduction in area, and 4. percentage elongation.

B Write short notes on (a) Resilience (b) Proof resilience, and (c) Modulus of   **[7M]**
resilience

SECTION-II

3 **A** Determine the thickness of a 120 mm wide uniform plate for safe continuous   **[7M]**
operation if the plate is to be subjected to a tensile load that has a maximum value of 250 kN and a minimum value of 100 kN. The properties of the plate material are as follows: Endurance limit stress = 225 MPa, and Yield point stress = 300 MPa. The factor of safety based on yield point may be taken as 1.5

B What is meant by `stress concentration'? How do you take it into   **[7M]**
consideration in case of a component subjected to dynamic loading?

OR

4 A cold drawn steel rod of circular cross-section is subjected to a variable   **[14M]**
bending moment of 565 N-m to 1130 N-m as the axial load varies from 4500 N to 13 500 N. The maximum bending moment occurs at the same instant that the axial load is maximum. Determine the required diameter of the rod for a factor of safety 2. Neglect any stress concentration and column effect.
Assume the following values:
Ultimate strength = 550 MPa
Yield strength = 470 MPa
Size factor = 0.85

Surface finish factor = 0.89

Correction factors = 1.0 for bending = 0.7 for axial load

The endurance limit in reversed bending may be taken as one-half the ultimate strength

SECTION-III

5   A double riveted lap joint is made between 15 mm thick plates. The rivet diameter and pitch are 25 mm and 75 mm respectively. If the ultimate stresses are 400 MPa in tension, 320 MPa in shear and 640 MPa in crushing, find the minimum force per pitch which will rupture the joint. If the above joint is subjected to a load such that the factor of safety is 4, find out the actual stresses developed in the plates and the rivets   **[14M]**

OR

6   A double riveted lap joint with zig-zag riveting is to be designed for 13 mm thick plates. Assume σt = 80 MPa ; τ = 60 MPa ; and σc = 120 MPa. State how the joint will fail and find the efficiency of the joint.   **[14M]**

SECTION-IV

7   *A*   How are the keys classified? Draw neat sketches of different types of keys and state their applications.   **[7M]**

     B   Design and draw a cotter joint to support a load varying from 30 kN in compression to 30 kN in tension. The material used is carbon steel for which the following allowable stresses may be used. The load is applied statically. Tensile stress = compressive stress = 50 MPa ; shear stress = 35 MPa and crushing stress = 90 MPa   **[7M]**

OR

8   *A*   Sketch two views of a knuckle joint and write the equations showing the strength of joint for the most probable modes of failure   **[7M]**

     B   Design a cotter joint to connect piston rod to the crosshead of a double acting steam engine. The diameter of the cylinder is 300 mm and the steam pressure is 1 N/mm2. The allowable stresses for the material of cotter and piston rod are as follows : σt = 50 MPa ; τ = 40 MPa ; and σc = 84 MPa   **[7M]**

SECTION-V

9   *A*   Describe, with the help of neat sketches, the types of various shaft couplings mentioning the uses of each type   **[7M]**

     B   Find the diameter of a solid steel shaft to transmit 20 kW at 200 r.p.m. The ultimate shear stress for the steel may be taken as 360 MPa and a factor of safety as 8. If a hollow shaft is to be used in place of the solid shaft, find the inside and outside diameter when the ratio of inside to outside diameters is 0.5   **[7M]**

OR

10   *A*   What are flexible couplings and what are their applications? Illustrate your answer with suitable examples and sketches.   **[7M]**

     B   A shaft made of mild steel is required to transmit 100 kW at 300 r.p.m. The supported length of the shaft is 3 metres. It carries two pulleys each weighing 1500 N supported at a distance of 1 metre from the ends respectively. Assuming the safe value of stress, determine the diameter of the shaft.   **[7M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, June 2022
Managerial Economics Financial Analysis
(ME&AE)

Roll No										

Time: 3 hours   **Max. Marks: 70**

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

1	Explain the concept of Cross Elasticity of Demand. Illustrate your answer with Examples.	**[14M]**
2	What are the possible approaches to forecasting demand for new products? Illustrate all the methods of Demand Forecasting.	**[14M]**
3	a. Discuss the role and importance of cost analysis in managerial decisions	**[7M]**
	b. Sales are Rs. 1, 10,000 Yielding a profit of Rs. 4,000. in period-I; Sales are Rs. 1, 50,000 with a profit of Rs. 12,000 in period-II. Determine BEP and Fixed Cost.	**[7M]**
4	Define 'Cost' Describe different cost concepts useful for organizations.	**[14M]**
5	What are the salient features Partnership firm, Explain Different kinds of partners and their advantages?	**[14M]**
6	Illustrate the different types of competition Markets with suitable examples.	**[14M]**
7	Explain the purpose of preparing the following accounts/statements and also elaborate the various items that appear in each of them.	
	a) Trading Account	**[7M]**
	b) Profit & Loss Account	**[7M]**
8	How are ratios classified for the purpose of financial analysis? With assumed data, illustrate any two types of ratios under each category	**[14M]**

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Code No: **R18A0312**

R18

MALLA REDDY COLLEGE OF ENGINEERING & TECH~~NOLO~~GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, June 2022
Computer Integrated Manufacturing Technologies
(ME)

Roll No										

Time: 3 hours   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1	Explain the merchants circle forces diagram and derive various force relationships.	**[14M]**
2	Describe the various types of lathes and its operations with neat sketches.	**[14M]**
3	Classify the various boring machines with brief notes of each one and write its specific operations performed on it.	**[14M]**
4	Describe the Jig boring machine with neat sketch and write its applications.	**[14M]**
5	Discuss the procedure for preparing a NC part program with an example.	**[14M]**
6	Briefly describe the CNC machining centres. With the help of a diagram differentiate between the operations of canned cycles G81 and G83.	**[14M]**
7	Discuss the concept of adaptive control and also explain its types.	**[14M]**
8	a) With neat sketch explain the working principle of Coordinate Measuring Machine (CMM) used for contact inspection of machine parts.	**[7M]**
	b) Discuss the applications of Coordinate Measuring Machine (CMM)	**[7M]**

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R18

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, June 2022
Design of Hydraulic Pneumatic Systems
(ME)

Roll No									

Time: 3 hours   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1	a) Write short notes about the various applications of hydraulic systems with suitable example.	**[7M]**
	b) Describe the working principle of radial piston pump with suitable sketch.	**[7M]**
2	a) List and explain the design criteria of Linear and Rotary pump in the hydraulic systems.	**[7M]**
	b) Explain the construction and working principle of in-line axial piston pump with suitable sketch.	**[7M]**
3	Explain the construction and working of following with neat sketch	
	(i) Gear motor	**[7M]**
	(ii) Double acting cylinder	**[7M]**
4	Explain with suitable sketch and mention the various possible locations of filters in the hydraulic circuit systems.	**[14M]**
5	Discuss the construction and working of a Mechanical hydraulic servo system with a diagram.	**[14M]**
6	A double acting cylinder is hooked up in a regenerative circuit for drilling application. The relief valve is set at 75bar.The piston diameter is140 mm and rod diameter is100mm.If the pump flow is 80 lpm. find the cylinder speed and load carrying capacity for various positions of direction control valve.	**[14M]**
7	a) With a neat sketch of the pneumatic Regulator and explain its construction and working.	**[7M]**
	b) Explain the ladder logic diagram with a suitable example.	**[7M]**
8	Explain in detail about Various selection criteria for pneumatic components	**[14M]**

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Code No: **R18A0313**

R18

MALLA REDDY COLLEGE OF ENGINEERING & TECH____GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, June 2022
Internal Combustion Engines
(ME)

Roll No										

Time: 3 hours   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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1	a) Explain the working of simple carburetor with neat sketch	**[7M]**
	b) Describe the working principle of a four stroke SI engine with a suitable diagram.	**[7M]**
2	a) Draw the diagram of A/F ratio versus throttle opening for different operating conditions of simple carburetor and explain salient features	**[7M]**
	b) Draw the neat sketch and explain the working of carter carburettor.	**[7M]**
3	What are the types of combustion chambers used in C.I. engines and explain their role in generating turbulence.	**[14M]**
4	a) How to create turbulence in C.I. Engine combustion chamber in order to get better mixing air fuel? Explain in detail	**[7M]**
	b) Explain the effect of various engine variables on SI engine knock	**[7M]**
5	a) Determine the process of evaluating indicated power of an IC engine.	**[7M]**
	b) The following data was recorded during testing of a 4-stroke cycle gas engine. Diameter= 10 cm, Stroke= 10 cm, Speed= 1200 rpm, Area of the positive loop of the indicator diagram=5.75 cm^2, Area of the negative loop of the indicator diagram=0.25 cm^2, Length of the indicator diagram= 55 mm, Spring constant= 3.5 bar/cm. Find the indicated power of the engine.	**[7M]**
6	A four cylinder, four stroke petrol engine has a 10 cm bore, 15 cm stroke and uses compression ratio of 6. The engine develops 25 kW indicated power at 2000 rpm. Find the mean indicated pressure and air standard efficiency. Also calculate the fuel consumption per hour, if the indicated thermal efficiency is 30%. Take the calorific value of fuel as 42 MJ/kg.	**[14M]**
7	a) Explain the working of roots blower compressor with neat sketch.	**[7M]**
	b) Explain the working principle of vane type rotary compressor along with a diagram and write its applications	**[7M]**

8   a) A rotary air compressor compresses 100 kg of air/minute from 1.2 bar and 293   **[7M]**
K to 4.8 bar. Find the power required to drive the compressor, if the compression
is isentropic and follows $pv^{1.3}$=constant

b) Compare the work inputs required for roots blower and a vane type compressor   **[7M]**
having the same induced volume of 0.03 m^3 per revolution, the inlet pressure
being 1.013 bar and the pressure ratio 1.5 to 1. For vane type, assume the initial
compression takes place through half the pressure range.

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, June 2022
Introduction to Java Programming
(EEE, ME, ECE & AE)

Roll No										

Time: 3 hours   **Max. Marks: 70**

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

1   What are the naming conventions for Java identifiers? Discuss the importance of **[14M]**
    Inheritance in java.

2   What is Type Casting. Explain the Overloading methods and constructors in java   **[14M]**

3   How java supports multiple inheritance? Explain the concept of overriding   **[14M]**
    binding.

4   Illustrate the usage of 'this' keyword. Write a Java interface to check whether a **[14M]**
    given number is palindrome or not?

5   What happens when there is no suitable try block to handle exception? List some   **[14M]**
    unchecked Exceptions

6   **[14M]**

    List the Exceptions related to File I/O and Describe the Thread Life cycle.

7   **[14M]**

    Distinguish between applets and applications and write a java program using applet

8   What are the limitations of AWT and discuss the important features of Swings.   **[14M]**

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R18

MALLA REDDY COLLEGE OF ENGINEERING & TECH___GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, June 2022
Machine Design - I
(ME)

Roll No										

Time: 3 hours   **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
***
Note: Design data books are permitted

1	a) What are the general considerations in the design of machine elements?	**[7M]**
	b) A cast iron pulley transmits 10 KW at 400 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.	**[7M]**
2	a) Define factor of safety for fatigue loading.	**[7M]**
	b) At a critical section in a shaft, the following stresses are induced: Bending stress=60 Mpa, Torsional shear stress =40 Mpa Determine the factor of safety, according to (i) maximum normal stress theory, (ii) maximum shear stress theory, (iii) maximum principal strain theory. The proportional limit in a simple tension test is found to be 300 Mpa. Take Poisson's ratio as 0.3.	**[7M]**
3	a) Describe the estimation of endurance strength?	**[7M]**
	b) Explain the factors that affect the fatigue strength.	**[7M]**
4	A torsion bar spring has a solid round 20 mm diameter section which blends smoothly at each end with a larger splined section. It is subjected to a completely reversed nominal torsional stress of 210 MN/m². Stress concentration is negligible, and the surfaces are machined. Estimate the fatigue life corresponding to each of the following materials : i) steel= 250 HB, ii) Cast iron Su= 350 MN/m².	**[14M]**
5	a) Discuss the advantages and disadvantages of riveted, bolted and welded joints.	**[7M]**
	b) Explain failures of a Riveted Joints.	**[7M]**
6	Design a double riveted butt joint with two cover plates for the longitudinal seam of a boiler shell 1.5 m in diameter subjected to a steam pressure of 0.95 N/mm2. Assume joint efficiency as 75%, allowable tensile stress in the plate 90MPa, compressive stress 140 MPa and shear stress in the rivet is 56 MPa.	**[14M]**

7 It is required to design a knuckle joint to connect circular shafts subjected to an axial force of 50kN. The rods are coaxial and a small amount of angular movement between their axes is permissible. Design the joint and specify the dimensions of its components. The allowable tensile, compressive and shear stress in the rod and pin material is limited to 80MPa, 100MPa and 40MPa respectively. **[14M]**

8 a) Explain the design procedure for flexible coupling. **[10M]**
b) Compare weight, strength and stiffness of two shafts of same material, subjected to same torque. One being solid other being hollow with inner diameter to outer diameter ratio 0.5. **[4M]**

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R18

MALLA REDDY COLLEGE OF ENGINEERING & TECH█████GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, November 2022
Managerial Economics Financial Analysis
(ME &AE)

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.

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SECTION-I

1		Define Demand. Explain Law of Demand with the help of a graph	**[14M]**
		OR	
2		What is elasticity of demand? Explain the measurements of elasticity of demand with suitable examples?	**[14M]**

SECTION-II

3		What is the production function explain the Cobb-Douglas function?	**[14M]**
		OR	
4		Describe Break Even Analysis (BEA) and how do you use this for decision making? What are Assumptions and limitations	**[14M]**

SECTION-III

5	*A*	Distinguish between perfect competition and monopoly.	**[4M]**
	B	What is pricing? Explain different methods of pricing.	**[10M]**
		OR	
6	*A*	Discuss the objectives of pricing?	**[4M]**
	B	Briefly explain any five methods of Pricing Strategies.	**[10M]**

SECTION-IV

7		Explain the factors affecting the requirements of working capital.	**[14M]**
		OR	
8		List and explain different types of errors in preparation of trial balance	**[14M]**

SECTION-V

9	*A*	Write the significance of liquidity ratios in the firm?	**[4M]**
	B	A project costs Rs.75,000, cost of capital is 15% and its cash inflows (Rs.) are given below. Compute the Net Present Value.	**[10M]**

Year	1	2	3	4	5
Cash Inflows	22,000	23,000	30,000	25,000	20,000

OR

10	*A*	How many different types of Activity Ratios.	**[4M]**
	B	What is ratio analysis? Discuss the different types of balance sheet ratios.	**[10M]**

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R18

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, November 2022
Computer Integrated Manufacturing Technologies
(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.

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SECTION-I

1	A	Differentiate between "orthogonal" and "oblique" cutting process?	[4M]
	B	Draw a single point cutting tool and define the various parts of it. Give the various standard angles of cutting tool and mention their significance in cutting operation.	[10M]

OR

2	A	Explain about the specifications of the lathe machine.	[7M]
	B	List out the taper turning operations. Explain them with neat sketches.	[7M]

SECTION-II

3	A	What is the working principle of a shaper? With the help of a neat sketch, explain about the principal parts of a shaper.	[7M]
	B	Describe the working and construction of a Whitworth quick return mechanism of a shaper.	[7M]

OR

4	A	Explain the twist drill with a neat sketch	[7M]
	B	What are the Slotting machine Operations:	[7M]

SECTION-III

5	A	Explain Automatically Programmed Tool	[7M]
	B	Explain types of CNC Machining Operations	[7M]

OR

6	A	What is a CNC Machine? What are the different types of CNC machines and Machine tools	[8M]
	B	Explain Interchangeable tooling systems	[6M]

SECTION-IV

7	A	Explain adaptive control as it pertains to numerical control.	[7M]
	B	What do you understand by enhanced DNC?	[7M]

OR

8	A	Explain the general structure of post processor.	[7M]
	B	Explain the concept of adaptive control for turning process.	[7M]

SECTION-V

9	A	Explain Noncontact inspection methods	[7M]
	B	Explain the terminology in quality control	[7M]

10   A   Explain contact inspection methods   [7M]

       B   Explain how Artificial Intelligence useful in CAD   [7M]

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, November 2022
Design of Hydraulic Pneumatic Systems
(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.

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SECTION-I

1	A	Explain the advantages, drawbacks, and applications of Hydraulic pumps?	[7M]
	B	What is the different between a variable displacement pump and fixed displacement pump?	[7M]

OR

2	A	Classify pumps? Also explain the construction of any one pump.	[7M]
	B	Describe the selection of hydraulic fluid?	[7M]

SECTION-II

3	A	Explain any one type of hydraulic actuators with neat sketch.	[7M]
	B	Why is cushioning needed in a hydraulic cylinder? Explain with a neat sketch, the principle of operation of a fixed cushioned cylinder?	[7M]

OR

4	A	Where telescopic cylinder is preferred? Explain the working of telescopic cylinder with neat sketch?	[7M]
	B	Explain semi-rotary actuator with neat sketch	[7M]

SECTION-III

5	A	Explain the working principle of fail-safe circuit with neat sketch?	[7M]
	B	Explain the working principle of automatic cylinder reciprocating system?	[7M]

OR

6	A	Classify and explain the working principle of accumulators?	[7M]
	B	Explain the working principle of Two Handed Safety Control Circuit?	[7M]

SECTION-IV

7	A	Explain the properties of air? Also describe various perfect laws?	[7M]
	B	Explain the filter regulator lubricator unit with neat sketch?	[7M]

OR

8	A	Explain the working of air control valves and quick exhaust valves?	[7M]
	B	Explain the working principle of compressor with neat sketch?	[7M]

SECTION-V

9	A	Explain the design of Hydraulic circuits for drilling?	[7M]
	B	Discuss the Trouble Shooting and Remedies in Hydraulic and Pneumatic systems?	[7M]

OR

10		Describe Hydraulic press and Forklift applications of Hydraulic and Pneumatic systems with neat sketch?	[14M]

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R18

MALLA REDDY COLLEGE OF ENGINEERING & TECH GY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, November 2022
Internal Combustion Engines
(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.

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SECTION-I

1   **A**   Compare the Otto, diesel, and dual cycle at (i) same compression ratio (ii) same maximum temperature and pressure?   **[7M]**

  B   Explain the differences between Actual and Fuel-Air Cycles of CI Engines with examples?   **[7M]**

OR

2   **A**   Draw a typical induction system of a petrol engine and also enlist the factors which affect the process of carburetion   **[7M]**

  B   With neat sketches, explain the working principle of four-stroke spark ignition engine?   **[7M]**

SECTION-II

3   **A**   Describe the phenomenon of knocking and discuss different factors affecting the knocking in SI engine?   **[7M]**

  B   Explain the factors that affect the engine variables in CI engine?   **[7M]**

OR

4   **A**   Explain the types of combustion chambers in CI engine with neat sketches?   **[7M]**

  B   Explain the phenomenon of pre-ignition? How pre-ignition leads to detonation and vice versa? What are the ill effects of pre-ignition?   **[7M]**

SECTION-III

5   **A**   Following readings are obtained during a test on a single cylinder, four stroke I.C. engine: Engine speed=300 rpm; diameter of orifice of the air tank=20 mm; pressure causing air flow through the orifice=100 mm of water column. Find the quantity of air consumed per second, if the density under atmospheric conditions is 1.15kg/m³. Take the coefficient of discharge for the orifice as 0.7   **[7M]**

  B   A single cylinder two stroke oil engine having bore of 11 cm and stroke 15 cm develops a torque of 56.3 Nm. The piston speed is 5 m/s. The mechanical efficiency and indicated thermal efficiency of the engine are 80% and 40% respectively CV of the fuel used 45 MJ/kg. Determine i) I.P ii) Indicated mean effective pressure iii) Specific fuel consumption on B.P.basis?   **[7M]**

OR

6   A trial conducted on a 4s single cylinder oil engine having bore x stroke dimension of 30 cm x 45 cm gave the following results. Duration of trial: 54   **[14M]**

1

minutes; Fuel consumed: 7 litres; Density of fuel: 800 kg/m^3 , Calorific value: 42 MJ/kg; Total number of revolutions: 12624, Mean effective pressure: 7.25 bar; Net load on the brake: 150 kg, Brake diameter: 1.78 m; cooling water circulated: 550 litres, Temperature rise of water: 30°C; Exhaust gas temperature: 250°C, Room temperature: 30°C; air –fuel ratio: 18:1, Calculate brake thermal efficiency, mechanical efficiency, specific fuel consumption, volumetric efficiency and prepare a heat balance sheet

SECTION-IV

7	A	What are the different types of rotary compressors? Describe with neat sketches the working of rotary compressors?	[7M]
	B	A two-stage air compressor air from 1 bar and 20°C to 42 bar. If the law of compression is $PV^{1.35}$ = constant and the intercooling is complete to 20°C, find per kg of air:1. The work done is compressing; and 2. The mass of water necessary for abstracting the heat in the intercooler, if the temperature rise of the cooling water is 25^{0o}C?	[7M]

OR

8	A two- stage single acting reciprocating compressor takes in air at the rate of 0.2 m^3/s. The intake pressure and temperature of air 0.1MPa and 16 °C. The air is compressed to a final pressure of 0.7Mpa. The intermediate pressure is ideal and intercooling is perfect. The compression index in both the stages is 1.25 and the compressor runs at 600 r.p.m. Neglecting clearance determine:
	         i. The intermediate pressure
	         ii. The total volume of each cylinder,
	         iii. The power required to drive the compressor and
	         iv. The rate of heat rejection in the intercooler.
		[14M]

SECTION-V

9	A	Write the differences between a) reciprocating and rotary compressors b) centrifugal and axial flow compressors	[7M]
	B	Explain the working principle of Centrifugal compressor with neat sketch? Also, explain the advantages of centrifugal compressor over reciprocating and rotary compressors?	[7M]

OR

10	A	Draw the velocity triangle of centrifugal compressor and explain shape-losses, slip factor, power input factor, pressure coefficient and adiabatic coefficient?	[8M]
	B	Define the following as applied to Axial compressor	[2M]
		i) Degree of reaction	[2M]
		ii) polytropic efficiency	[2M]
		iii) Isentropic efficiency	

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, November 2022
Introduction to Java Programming
(EEE, ME, ECE & AE)

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.

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SECTION-I

1	*A*	Discuss in detail about Various Object Oriented Programming concepts?	**[14M]**

OR

2	*A*	What are the drawbacks of procedural languages? Explain the need of object oriented programming with suitable program.	**[7M]**
	B	What are the primitive data types in Java? Write about type conversions	**[7M]**

SECTION-II

3	*A*	Explain method overriding with a suitable example program.	**[7M]**
	B	With suitable program segments describe the usage of 'super' keyword	**[7M]**

OR

4	*A*	What is a nested class? Differentiate between static nested classes and non-static nested classes.	**[7M]**
	B	How to define a package? How to access, import a package? Explain with examples.	**[7M]**

SECTION-III

5	*A*	With a suitable Java program explain user-defined exception handling.	**[7M]**
	B	What is meant by built in exceptions? Discuss a suitable scenario for this.	**[7M]**

OR

6	*A*	Analyze the usage of try, catch, throw blocks with an example.	**[7M]**
	B	Describe the need of thread synchronization. How is it achieved in Java programming? Explain with a suitable program.	**[7M]**

SECTION-IV

7	*A*	With a Neat diagram, Explain the Life cycle of an Applet?	**[7M]**
	B	What support is provided by File class for file management? Illustrate with suitable scenarios.	**[7M]**

OR

8	*A*	Differentiate between applets and applications with clear examples?	**[7M]**
	B	Write a program to copy the contents of file1 to file 2. Read the names of files as command line arguments	**[7M]**

SECTION-V

9	*A*	What is the significance of layout managers? Discuss briefly various layout managers	**[7M]**
	B	Explain any three Swing components?	**[7M]**

OR

10	*A*	Explain the steps involved in creating CheckBox, RadioButton, Button, Label in AWT	**[7M]**
	B	Write a program to demonstrate various keyboard events with suitable functionality	**[7M]**

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R18

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
III B.Tech I Semester Supplementary Examinations, November 2022
Machine Design - I
(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.

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SECTION-I

1 **A** Explain the following

  i) Differentiate the toughness and resilience   **[4M]**

  ii) What are preferred numbers? How they are useful?   **[3M]**

  B How the plain carbon steels are designated? Explain the meaning of each term?   **[7M]**

OR

2 **A** Define Factor of safety and explain the factors that influences FOS   **[4M]**

  B A bar 3 m long is made of two bars, one of copper having E = 105 GN/m² and the other of steel having E = 210 GN/m². Each bar is 25 mm broad and 12.5 mm thick. This compound bar is stretched by a load of 50 kN. Find the increase in length of the compound bar and the stress produced in the steel and copper. The length of copper as well as of steel bar is 3 m each.   **[10M]**
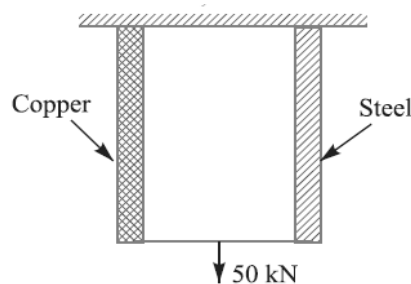
SECTION-II

3 **A** Find the maximum stress induced in the following cases taking stress concentration into account:
  A rectangular plate 60 mm ×10 mm with a hole 12 diameter as shown in Fig. (a) and subjected to a tensile load of 12 kN.   **[7M]**
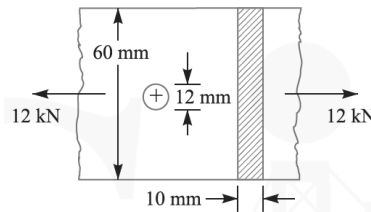
60 mm

(+) 12 mm

12 kN   12 kN

10 mm →| |←

Fig. (a)

B   Find the maximum stress induced in the following cases taking stress **[7M]** concentration into account:
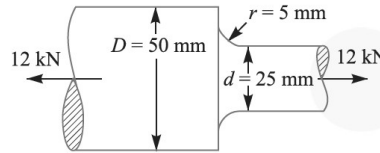A stepped shaft as shown in Fig. 6.13 (b) and carrying a tensile load of 12 kN.

$r = 5$ mm

$D = 50$ mm

12 kN   12 kN

$d = 25$ mm

Fig. (b)

OR

4   A   Explain the following terms in connection with design of machine members **[8M]** subjected to variable loads:
(a) Endurance limit, (b) Size factor, (c) Surface finish factor, and (d) Notch sensitivity.

     B   What information do you obtain from Soderberg diagram? **[6M]**

SECTION-III

5   A   State the assumptions made in the design of welded joint **[4M]**

     B   Design a double riveted butt joint with two cover plates for the longitudinal **[10M]** seam of a boiler shell 1.5m in diameter subjected to a steam pressure of 0.95 N/mm^2.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.

OR

6   A   State the assumptions made in the design of riveted joint **[4M]**

     B   Design the longitudinal joint for a 1.25 m diameter steam boiler to carry a **[10M]** steam pressure of 2.5 N/mm^2. The ultimate strength of the boiler plate may be assumed as 420 MPa, crushing strength as 650 MPa and shear strength as 300 MPa. Take the joint efficiency as 80%. Sketch the joint with all the dimensions. Adopt the suitable factor of safety.

SECTION-IV

7   A   Draw a neat sketches of the following: **[7M]**
i) Sunk key ii) Gib head key iii) Woodruff key

     B   Design a cotter joint to transmit a load of 2 KN. Take allowable stress values **[7M]** in tension and shear as 70 N/mm^2 and 30 N/mm^2, respectively

OR

8   A   Why gibs are used in cotter joint? **[4M]**

     B   A steel shaft 120mm in diameter and 1m long has a flywheel fitted at one **[10M]** end and rotates at 240rpm .when the shaft is suddenly stopped, determine the angle of twist and shear stress induced in shaft the mass of fly wheel is 100 kg and its radius of gyration is 350mm.

2

take G=0.84 *10^5 Mpa

9   A   Why a flexible coupling is called by that name? Explain with a sketch   **[4M]**

   B   Design a CI protective type flange coupling to transmit 15 KW at 900 rpm.   **[10M]**
      The following permissible stresses may be used. Shear stress for shaft, bolt
      and key=40 MPa. Crushing stress for bolt and key =80 MPa, shear stress for
      C.I. = 8 MPa, Draw a neat sketch of the coupling

                                    OR

10   A   A hollow shaft of 0.5 m outside diameter and 0.3 m inside diameter is used   **[10M]**
      to drive a propeller of a marine vessel. The shaft is mounted on bearings
      6 metre apart and it transmits 5600 kW at 150 r.p.m. The maximum axial
      propeller thrust is 500 kN and the shaft weighs 70 kN.
      Determine :
      The maximum shear stress developed in the shaft, and

   B   Determine (Using the above data) :   **[4M]**
      The angular twist between the bearings.

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