Code No: R17A0308

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular Examinations, April/May 2019

Thermal Engineering

(ME)

Roll No										

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1	(a)	Compare fuel air cycle with air standard cycle in IC engine.	**[7M]**
	(b)	Explain the valve timing diagram for 4-stroke petrol engine	**[7M]**
		OR	
2	(a)	Compare fuel-air cycles with actual cycles	**[7M]**
	(b)	Describe the battery ignition system used in SI engines	**[7M]**

SECTION-II

3		Describe the factors that affect flame propagation in SI engine combustion	**[14M]**
		OR	
4		Describe the four stages of combustion with neat sketches in CI engines.	**[14M]**

SECTION-III

5	(a)	Describe in detail Wilan's line method for estimating frictional losses.	**[7M]**
	(b)	Describe Morse Test. What are its limitations?	**[7M]**
		OR	
6		A four cylinder four stroke SI engine runs at 3000 rpm. Each cylinder has a bore and stroke of 90 mm and 110 mm respectively. The clearance volume per cylinder is 60 cc. The fuel consumption rate is 18 kg/h and the torque developed is 150kN-m. The calorific value of the fuel is 42 MJ/kg. Calculate the (i) Brake Power (ii) Brake Mean Effective Pressure (iii) Brake thermal efficiency and (iv) Relative efficiency	**[14M]**

SECTION-IV

7	(a)	Classify the compressors	**[4M]**
	(b)	Derive an expression for optimum pressure ratio with minimum work input in a two stage reciprocating air compressor	**[10M]**
		OR	
8		2.5 kg/s of air enters the LP cylinder of a two stage reciprocating air compressor. The overall pressure ratio is 9. The air at inlet is at 1 bar 25^0C. The compression index is 1.3. Determine the minimum work required to drive the compressor. Also find the percentage saving in work when compared with single stage compression. Take R for air as 285 J/kgK.	**[14M]**

SECTION-V

9	(a)	Describe the working of a centrifugal compressor with a neat sketch	**[8M]**
	(b)	Sketch the velocity triangles for an impeller blade of a centrifugal compressor.	**[6M]**

OR

10 An axial flow compressor compresses air from an inlet pressure of 1bar and 25^0C to a delivery pressure of 6 bar. The overall isentropic efficiency is 90% and the degree of reaction is 50%. The inlet and exit blade angles are 45^0 and 12^0 respectively. The mean blade speed is 190 m/s. Assuming a power input factor of 0.85, calculate the number of stages required to achieve the desired pressure ratio. **[14M]**

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Code No: R17A0551 **R17**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular Examinations, April/May 2019

Database Systems

(EEE, ME & ECE)

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	Explain the Architecture of DBS and applications of DBS?	**[14M]**
	OR	
2	Differentiate between File Processing System Vs DBS and levels of abstraction DBS?	**[14M]**

SECTION-II

3	What is an E-R Diagram and Construct an E-R diagram for university registrar's office. The office maintains data about each class, including the instructor, the enrollment and the time and place of the class meetings	**[14M]**
	OR	
4	a) Explain the E-R diagram of a college	**[7M]**
	b) Define the following terms of i) Weak Entity Set ii) Trigger iii) Primary key iv) Super key v) Candidate key	**[7M]**

SECTION-III

5	a) Discuss in detail the operators SELECT, PROJECT, UNION with suitable example?	**[7M]**
	b) Explain about different DML operations.	**[7M]**
	OR	
6	Explain the following with examples i) Aggregate functions ii) Group by having clause iii) join iv) Equi join v) Nested quires	**[14M]**

SECTION-IV

7	What is normalization? What are the conditions are required for a relation to be in 1NF,2NF, 3NF and BCNF with examples	**[14M]**
	OR	
8	What is meant by functional dependency? And Explain the Multi valued dependencies and join dependencies with examples.	**[14M]**

SECTION-V

9	a) What is a transaction? Explain the ACID properties of a transaction?	**[7M]**
	b)) Explain the testing for serializability.	**[7M]**
	OR	
10	a) Explain the transaction concept with examples.	**[7M]**
	b) Explain the following i) serializability ii) Recoverability	**[7M]**

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Code No: R17A0307 **R17**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular Examinations, April/May 2019

Dynamics of Machinery

(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 The rotor of a turbojet engine has mass 200kg and a radius of gyration 25cm. The engine rotates at a speed of 10000 rpm in clock-wise direction when viewed from the front of the aeroplane. The plane while flying at 1000km/hr truns with radius of 2km to right. Compute the gyroscopic moment that the rotor exerts on the plane structure. Determine the nose of the plane tends to rise or fall when the plane turns. **[14M]**

OR

2 A rear engine automobile is traveling along a truck of 100 meters mean radius. Each of the four road wheels has a moment of inertia of 2 kg-m^2 and an effective diameter of 0.6m. The rotating parts of the engine have a moment of inertia of 1 kg-m^2. The engine axis is parallel to the rear axle and the crank shaft rotates in the same sense as the road wheels. The gear ratio of engine to the back wheel is 3 to 1. The vehicle has a mass of 2000kg and its centre of gravity is 0.5m above the road wheel. The width of the track of the vehicle is 1.5m. Determine the limiting speed of the vehicle around the curve for all four wheels to maintain contact with the road surface. **[14M]**

SECTION-II

3 A multiple collar thrust bearing has flat contact surfaces of30cm and 40cm internal and external diameters respectively and supports an axial thrust of 10000kg. Coefficient of friction between bearing surface is 0.05. Assuming the condition of uniform wear, determine **[07M]**

a) Number of collars required and 2.Power lost in friction, when the shaft rotates at 200 rpm. **[07M]**

b) The maximum intensity of pressure between the bearing surfaces is not to exceed 4kg/cm^2.

OR

4 A friction clutch is to transmit 10kW at 3000 rpm. It is to be of single plate type with both sides of the plate effective, the axial pressure being limited to 0.09N/mm^2. If the external diameter of the friction lining is 1.4 times the internal diameter, find the required dimensions of the friction lining. **[14M]**

SECTION-III

5 A band and block brake, having 14 blocks each of which subtends an angle of 15^o at the centre, is applied t a drum of 1m effective diameter. The drum and flywheel mounted on the same shaft weigh 2000kg and a combined radius of gyration of 50cm. The two ends of the band are attached to pins on opposite sides of the brake lever at distance of 3cm and 12cm from the fulcrum. If a **[14M]**

force of 20kg is applied at a distance of 75cm from the fulcrum, find

1. Maximum braking torque
2. Angular retardation of the drum, and
3. Time taken by the system to come to rest from the rated speed of 360rpm.

OR

6 The turning moment diagram for a multicylinder engine has been drawn to be a scale 1 mm=600 N-m vertically and 1mm=3^0 horizontally. The intercepted areas between the output torque curve and the mean resistance line, taken in order from one end , are as follows: **[14M]**
+52,-124,+92,-140,+85,-72 and +107 mm^2, when the engine is running at a speed of 600 rpm. If the total fluctuation of speed is not to exceed ± 1.5 of the mean, find the necessary mass of the flywheel of radius 0.5m.

SECTION-IV

7 Data of three unbalanced masses A, B, and C are M_a=4kg, M_b=3kg, M_c=2.5kg, R_a=75mm, R_b=85mm, R_c=50mm, θ_a=45°, θ_b=135°, θ_c=240°. The shaft length is 800mm between bearings. These three masses are completely balanced by two counter masses located 75mm from each bearing. The axial distance of 3 unbalanced masses are L_a=150mm, L_b=350mm and L_c=525mm from right hand side counter mass plane. Determine the masses and angular position of the counter masses, if the radial location of counter masses are R_{b1}=75mm and R_{b2}=40mm. **[14M]**

OR

8 Ina single degree damped vibrating system a suspended mass of 3.75kg makes 12 oscillations in 7 sec when disturbed form its equilibrium position. The amplitude of vibrations reduces to 0.33 of its initial value in 4 oscillations. Determine **[14M]**

(i) The stiffness of the spring
(ii) The logarithmic decrement
(iii) The damping factor
(iv) The damping co-efficient.

SECTION-V

9 A porter governor has four arms of 30cm long. The upper arms are pivoted at the axis of rotation and the lower arms are attached to the sleeve at distance of 3.5cm from the axis. The mass of each ball is 7kg and the mass of the sleeve is 54kg. Determine the equilibrium speed for the two extreme radii of 20cm and 25cm of rotation of the governor balls and the range of speed. **[14M]**

OR

10 A governor of Hartnell type has equal balls of 3kg, initially at a radius of 200mm. The length of bell cranks are 110mm vertically and 150mm horizontally. Find (i) Initial Compression force on the spring at a radius of 200mm at 240rpm (ii) the stiffness of the spring required to permit a sleeve movement of 4mm on a fluctuation of 7.5% in the engine speed. **[14M]**

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Code No: R17A0309

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular Examinations, April/May 2019

Fluid Mechanics and Hydraulic Machinery

(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) Define terms, Weight density, Sp gravity, Viscosity. **[3M]**

b) Find the height through which water rises by capillary action in a glass tube of 2mm diameter, if the surface tension is 0.075N/m **[5M]**

c)A plate 0.05mm distant from a fixed plate moves at 1.2m/s and requires a force of 2.2 N/m to maintain this speed. Find the viscosity of the fluid between the plates. **[6M]**

OR

2 a) State and Explain Newton's law of viscosity. **[4M]**

b) The space between two parallel square plates each of side 0.8 m is filled with an oil of specific gravity 0.8. If the space between the plates is 12.5mm and the upper plate which moves with velocity of 1.25m/s requires a force of 51.2N. Determine **[10M]**

i. Dynamic viscosity of the oil in poise

ii. Kinematic viscosity in stokes.

SECTION-II

3 a) Differentiate the following **[4M]**

i. Laminar flow and Turbulent flow.

ii. Compressible flow and incompressible flow. **[4M]**

b) Derive an equation of continuity of liquid flow.

c) Water is flowing through a pipe of 100 mm diameter with an average Velocity of 10 m/s. Determine the rate of discharge of the water in liters/s. Also determine the velocity of water at the other end of the pipe. If the diameter of the pipe is 200 mm. **[6M]**

OR

4 a) State and Prove Bernoulli's equation from Euler's equation of motion. Also state its assumptions **[7M]**

b) A pipe 300m has a slope of 1 in 100 and tapers from 1m diameter at the higher end to 0.5 m at the lower end. The quantity of water flowing is 900 Ltrs/sec. If the pressure at the higher end is 70 kPa, find the pressure at lower end. **[7M]**

SECTION-III

5 a) What are the devices used to measure the fluid flow. **[4M]**

b) A venturimeter has an area ratio of 9 to 1, the larger diameter being 300 mm. During the flow, the recorded pressure head in the larger section is 6.5m and that at the throat is 4.25m. Take C_d = 0.99, compute the discharge through the venturimeter **[10M]**

OR

6 a) Define and explain the following terms **[6M]**

i. Hydraulic gradient line and

ii. Total energy line.

b) Determine the difference in the elevations between the water surfaces in the two tanks which are connected by a horizontal pipe of diameter 400 mm and length 500m. the rate of flow of water through the pipe is 200 ltrs./s. consider all the losses and take the value of f=0.009 **[8M]**

SECTION-IV

7 a) Classify hydraulic turbines. **[4M]**

b) A Pelton wheel is to be designed for the following specifications. Power= 735.75 kW S.P head= 200m, Speed=800rpm, overall efficiency=0.86 and jet diameter is not to exceed one-tenth the Wheel diameter. Determine **[10M]**

i. Wheel diameter,

ii. The no of jets required and

iii. Diameter of the jet. Take C_v=0.98 and speed ratio=0.45

OR

8 a) Define Unit Power, Unit speed, unit discharge. **[4M]**

b) A Kaplan turbine develops 1750 KW under a head of 100 meters while running at 200 rpm and discharging 2500 ltrs/sec. Find the unit power, unit speed and unit discharge. **[10M]**

SECTION-V

9 a) Differentiate centrifugal and reciprocating pump. **[4M]**

b) A centrifugal pump is to discharge water at the rate of 110 Ltrs/s at a speed of 1450 rpm against a head of 23m. The impeller diameter is 250 mm and its width 50mm. If the manometric efficiency is 75%, determine the vane angle at the outer periphery. **[10M]**

OR

10 a) classify the reciprocating pumps. **[6M]**

b) A single acting reciprocating pump has a plunger of diameter 300mm and stroke 200mm. if the speed of the pump is 30r.p.m. and it delivers 6.5 liters/sec of water, find the coefficient of discharge and the percentage slip of the pump. **[8M]**

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Code No: R17A0061 **R17**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular Examinations, April/May 2019

Managerial Economics and 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	State the law of demand? Explain the determinants of demand.		**[14M]**
	OR		
2	Define Elasticity of Demand. How is it measured?		**[14M]**

SECTION-II

3	Explain the break even analysis with suitable examples.		**[14M]**
	OR		
4	(i)	What is a Cobb-Douglas Production Function?	**[7M]**
	(ii)	Explain Isocost and Isoquants with suitable examples.	**[7M]**

SECTION-III

5	Explain the different methods of pricing.		**[14M]**
	OR		
6	Explain the Changing India Business Environment in Post-liberalization scenario.		**[14M]**

SECTION-IV

7	Explain the Methods and sources of raising finance.		**[14M]**
	OR		
8	Explain the Trading Account, Profit and Loss Account and Balance Sheet.		**[14M]**

SECTION-V

9	(i)	What is meant by capital budgeting?	**[6M]**
	(ii)	Explain about Net present value method.	**[8M]**
	OR		
10	Explain Liquidity Ratios and Activity Ratios,		**[14M]**

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Code No: R17A0311

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular Examinations, April/May 2019

Production Technology

(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	Explain Investment casting process and mention its advantages	**[14M]**
	OR	
2	What are the types of patterns, patterns making materials and explain it	**[14M]**

SECTION-II

3	Discuss the TIG welding process and its applications.	**[14M]**
	OR	
4	Explain the importance of resistance welding in detail.	**[14M]**

SECTION-III

5	Write a note on (a) Strain hardening (b) Recrystallisation	**[14M]**
	OR	
6	Explain the concept of theory of rolling	**[14M]**

SECTION-IV

7	Mention the types of sheet metal operations and explain bending operation	**[14M]**
	OR	
8	Explain Deep drawing process and its features	**[14M]**

SECTION-V

9	Explain basic Extrusion process and its characteristics	**[14M]**
	OR	
10	Write a note on (a) Smith forging (b) Roll forging	**[14M]**

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Code No: R17A0308

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Thermal Engineering

(ME)

Roll No										

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1 Discuss the effect of time loss factor, heat loss factor and exhaust blowdown on the performance of actual cycles. **[14M]**

OR

2(a) Compare the compression ignition engine and spark ignition engine. **[7M]**

2(b) What is carburetion? Explain the working of simple carburetor with a neat sketch **[7M]**

SECTION-II

3(a) Discuss the phenomenon of knocking in SI engines in detail. **[7M]**

3(b) Enlist and explain the harmful effects if detonation in SI engines. **[7M]**

OR

4(a) Describe different stages of combustion process in compression ignition engines with pressure-crank angle (p-θ) diagram. **[7M]**

4(b) How the ignition delay during the combustion in compression ignition engines can be divided into. List out the parameters affecting the ignition delay. **[7M]**

SECTION-III

5 Define fractional power of an internal combustion engine. Explain various methods to determine the fractional power of internal combustion engines. **[14M]**

OR

6 An eight cylinder, four-stroke engine of 9 cm bore and 8 cm stroke with a compression ratio of 7 is tested at 4500 rpm on a dynamometer which has 54 cm arm. During a 10 minutes test the dynamometer scale beam reading was 42 kg and the engine consumes 4.4 kg of gasoline having a calorific value of 44000 kJ/kg. Air at 27^0C and 1 bar was supplied to the carburettor at the rate of 6 kg/min. Find (i) the brake power delivered (ii) the brake mean effective pressure (iii) the brake specific fuel consumption (iv) the brake specific air consumption (v) the brake thermal efficiency (vi) the volumetric efficiency and (vii) the air-fuel ratio **[14M]**

SECTION-IV

7(a) Classify the air compressors. **[7M]**

7(b) Explain the working of single-acting reciprocating type air compressor with a neat sketch. **[7M]**

OR

8(a) Explain the construction and working of roots blower. **[7M]**

8(b) Describe the construction and working of Lysholm compressor with necessary diagrams. **[7M]**

SECTION-V

9(a)	Discuss the effect of impeller blade shape on the performance of a centrifugal compressor.	**[7M]**
9(b)	Define slip, slip factor, work factor and pressure coefficient and write their mathematical forms.	**[7M]**

OR

10(a)	Enlist and discuss the losses in axial flow compressors.	**[7M]**
10(b)	Define degree of reaction. Differentiate between isentropic and polytropic efficiency of an axial flow compressor.	**[7M]**

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Code No: R17A0551

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Database Systems

(ME & ECE)

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)	Describe the Architecture of a database?	**[10M]**
	b)	Mention the users of Database in detail?	**[4M]**
		OR	
2	a)	List and write about DBMS Languages?	**[7M]**
	b)	Write about the role of DBA?	**[7M]**

SECTION-II

3	Define and Give example for the following?		
	a)	Primary Key	**[4M]**
	b)	Super key	**[3M]**
	c)	Candidate key	**[4M]**
	d)	Attribute	**[3M]**
		OR	
4	a)	What is a Trigger? Discuss triggers in detail?	**[7M]**
	b)	Define Schema? Explain Representation of Various ER Schemas.	**[7M]**

SECTION-III

5	a)	Write about the following set operations? i)UNION, ii) INTERSECT, and iii)EXCEPT	**[9M]**
	b)	Write the query to create a table	**[5M]**
		OR	
6	a)	Explain aggregate functions with examples?	**[9M]**
	b)	Discuss NULL Values in SQL?	**[5M]**

SECTION-IV

7	a)	Explain lossless-join decomposition?	**[7M]**
	b)	Discuss Boyce/Codd normal form with example?	**[7M]**
		OR	
8	a)	Write about Multi-valued dependencies & Join dependencies?	**[7M]**
	b)	Explain 2NF and 3NF with examples?	**[7M]**

SECTION-V

9	a)	Explain Serializability with example?	**[7M]**
	b)	Write about implementation of isolation?	**[7M]**
		OR	
10	a)	Explain Testing for serializability in topological sorting?	**[7M]**
	b)	Write and explain transaction concept with example?	**[7M]**

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Code No: R17A0307

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Dynamics of Machinery

(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) With help of neat sketch explain the working principle of Gyroscope **[7M]**

b) Describe the effect of precession motion on the stability of moving vehicles **[7M]**

OR

2 The mass of a turbine rotor of a ship is 8 tones and has a radius of gyration 0.6 m. It rotates in 1800 r.p.m. clockwise when looking from the stern. Determine the gyroscopic couple and its effects in the following cases: **[14M]**

i) If the ship travelling at 100 km / h steers to the left in a curve of 75 m radius,

ii) If the Ship pitches with the bow rising at an angular velocity of 0.5 rad/sec.

iii) If the ship is rolling and at a certain instant has an angular velocity of 0.03 rad/s clockwise when looking from stern.

SECTION-II

3 A band and block brake has 14 blocks. Each block subtends an angle of 140 at the centre of the rotating drum. The diameter of the drum is 750mm and the thickness of the blocks is 65mm. the two ends of the band are fixed to the pins on the lever at the distances of 50mm and 210mm from the fulcrum on the opposite sides. Determine the least force required to be applied at the lever at a distance of 600mm from the fulcrum if the power absorbed by the blocks is 180Kw at 175rpm. Coefficient of friction between the blocks and the drum is 0.35. **[14M]**

OR

4 Illustrate the working of multi plate clutch with a neat sketch. And derive the expression for frictional torque transmitted in single plate clutch. **[14M]**

SECTION-III

5 A differential band brake has a drum with a diameter of 800 mm. The two ends of the band are fixed to the pins on the opposite sides of the fulcrum of the lever at distances of 40mm and 200 mm from the fulcrum. The angle of contact is 270^0 and the coefficient of friction is 0.2. Determine the brake torque when a force of 600 N is applied to the lever at 800 mm from the fulcrum. **[14M]**

OR

6 The turning-moment diagram for a petrol engine is drawn to a vertical scale of 1 mm = 500 N.m and a horizontal scale of 1mm = 3^0. The turning-moment diagram repeats itself after every half revolution of the crank shaft. The areas above and below the mean torque line are 260, -580, 80, -380, 870 and -250 mm^2. The rotating parts have a mass of 55 kg and radius of gyration of 2.1 m. If the engine speed is 1600 rpm. Determine the coefficient of fluctuation of speed. **[14M]**

SECTION-IV

7 **a)** The axes of the three cylinder's air compressor are at 120° to one another, and their connecting rods are coupled to a single crank. The stroke is 160 mm and the length of each connecting rod is 240 mm. The mass of the reciprocating parts per cylinder is 2.4 kg. Find the maximum primary and secondary forces acting on the frame of the compressor when running at 2000 rpm. **[7M]**

b) Differentiate static and dynamic balancing with example **[7M]**

OR

8 A vibrating system consists of a mass of 50 kg, a spring of stiffness 30 kN/m and a damper. The damping provided is only 20 % of the critical value. Determine **[14M]**

i. the damping factor
ii. the critical damping coefficient
iii. the natural frequency of damped vibrations
iv. the logarithmic decrement
v. the ratio of two consecutive amplitudes.

SECTION-V

9 Describe the function of a Porter governor with the help of neat sketch. Establish the relation among the speed and height of the governor. Deduce the governing equation considering the friction at sleeve in case of porter governor. **[14M]**

OR

10 The lengths of the upper and lower arms of a porter governor are 200 mm and 250 mm, respectively. Both the arms are pivoted on the axis of rotation. The central load is 150 N, the weight of each ball is 20 N and the friction of the sleeve together with the resistance of the operating gear is equivalent to a force of 30N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30° and 40°, taking friction into account, find the range of speed of the governor. **[14M]**

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Code No: R17A0309

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Fluid Mechanics and Hydraulic Machinery

(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) Explicate the variation of viscosity with respect to temperature. **[6M]**

b) Two large plane surfaces are 2.4cm apart. The space between the surfaces is filled with glycerin. What force is required to drag a very thin plate of surface area 0.5 square meter between the two large plane surface at a speed of 0.6m/s, if : (i) the thin plane is in the middle of the two plane surfaces, and(ii) the thin plate is at a distance of 0.8cm from one of the plane surfaces? Take the dynamic viscosity of glycerin=0.810 NS/m^2. **[8M]**

OR

2 a) Differentiate between U-tube differential manometers and inverted U-tube differential manometers. **[7M]**

b) The right limb of a simple U-tube manometer containing mercury is open to atmospheric while the left is connected to a pipe in which a fluid of sp.gr. 0.9 is flowing. The centre of the pipe is 12cm below the level of mercury in the right limb. Find the pressure of the fluid in the pipe if the difference of mercury level in the two limbs is 20cm. **[7M]**

SECTION-II

3 a) Illustrate the Reynolds's experiment. **[7M]**

b) A 25 cm diameter pipe carries oil of specific gravity 0.9 at a velocity of 3 m/s. At another section the diameter is 20 cm. Find the velocity at this section and also mass rate of flow of oil. **[7M]**

OR

4 a) Illuminate the working of pitot-tube. **[7M]**

b) The water is flowing through a pipe having diameters 20cm and 10cm at sections 1 and 2 respectively. The rate of flow through pipe is 35 liters/s. The section 1 is 6m above datum and section 2 is 4m above datum. If the pressure at section 1 is 39.24 N/cm^2, find the intensity of pressure at section 2. **[7M]**

SECTION-III

5 a) Devise an expression for the momentum thickness of boundary layer. **[7M]**

b) Estimate the displacement thickness, the momentum thickness and energy **[7M]**

thickness for the velocity distribution in the boundary layer given by $(u/U)=(y/\delta)$ where u is the velocity at a distance y from the plate and u=U at $y=\delta$, where δ boundary layer thickness. Also find the value of δ^*/θ.

OR

6 a) Deduce an expression for the force exerted by a jet on a curved plate when jet strikes curved plate at one end tangentially, when the plate is unsymmetrical. **[7M]**

b) A jet of water of diameter 7.5cm strikes a curved plate at its centre with a velocity of 20m/s. the curved plate is moving with a velocity of 8m/s in the direction of the jet. The jet is deflected through an angle of 165^0. Assuming the plate smooth Evaluate: (i) force exerted on the plate in the direction of jet (ii) power of the jet and (iii) efficiency of the jet. **[7M]**

SECTION-IV

7 a) Elucidate different types of hydraulic turbines. **[7M]**

b) Illustrate the radial flow reaction turbine. **[7M]**

OR

8 a) Explain about governing mechanism of turbines. **[7M]**

b) Develop an expression for specific speed of turbines. **[7M]**

SECTION-V

9 a) Deduce an expression for work done by the centrifugal pump. **[7M]**

b) A centrifugal pump delivers water against a net head of 14.5 m and a design speed of 1000 rpm. The vanes are curved back to an angle of 30^0 with the periphery. The impeller diameter is 300 mm and outlet width is 50 mm. Find the discharge of the pump if manometric efficiency is 95%. **[7M]**

OR

10 a) Illustrate different types of reciprocating pumps. **[8M]**

b) Define the following terms

(i) slip **[2M]**

(ii) negative slip **[2M]**

(iii) percentage of slip **[2M]**

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Code No: R17A0061

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, April 2023

Managerial Economics and Financial Analysis

(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 Discuss the nature and scope of managerial economics. **[14M]**

OR

2 Determine the different types of elasticity of demand. **[14M]**

SECTION-II

3 Describe isoquants. What are the properties of isoquants? **[14M]**

OR

4 You are given the following data: **[14M]**
Sales 200 units at Rs. 20 per unit
Variable cost at Rs.10 per unit
Total fixed cost : Rs.800
You are required to calculate:
i. Profit
ii. Break-Even point (units)
iii. P/V Raio
iv. Break-Even point (sales value)

SECTION-III

5 Explain price and output determination under monopoly with help of diagram **[14M]**

OR

6 What is market structure? Explain the types of market structure with suitable examples. **[14M]**

SECTION-IV

7 What is accounting concepts? Discuss various accounting concepts in detail. **[14M]**

OR

8 During January 2022 Narayan executed the following transactions. **[14M]**

Date	Particulars	Rs.
1.	Commenced business with cash	40,000
2.	Purchased goods on credit from Shyam	30,000
3.	Received cash from Murthy as advance for Goods ordered by him	3,000
4.	Paid wages	500
5.	Goods returned to Shyam	200
6.	Goods sold to Kamal	10,000

7.	Goods returned by Kamal	500
8.	Paid into bank	500
9.	Goods sold for cash	750
10.	Bought goods for cash	1,000
11.	Paid salaries	700
12.	Withdrew cash for personal use	1,000

Journalize the above transactions.

SECTION-V

9 Explain Turnover Ratios and Profitability ratios with suitable examples. **[14M]**

OR

10 XYZ Ltd. is considering two mutually exclusive projects A and B whose cost of Capital is 12%. The details of which are given below: **[14M]**

	Project A	**Project B**
Investments	-3,00,000	-3,00,000
Estimated Cash inflow		
1st Year	80,000	70,000
2nd Year	1,00,000	1,20,000
3rd Year	1,30,000	1,40,000
4th Year	1,00,000	90,000
5th Year	80,000	60,000

Calculate the NPV @ 12% . Which project should be chosen as per NPV?

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Code No: R17A0308

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, December 2019

Thermal Engineering

(ME)

Roll No										

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

***

SECTION-I

1	a) Discuss the functional requirements of an injection system?		**[7M]**
	b) What are the limitations of simple carburetor and how to rectify them? Explain.		**[7M]**
	OR		
2	a)	What is the importance of valve and port timing diagrams of I C Engines.	**[7M]**
	b)	Describe the optimum opening position of exhaust valve to reduce the exhaust blow down loss in S I Engine.	**[7M]**

SECTION-II

3	a)	Draw the diagram of A/F ratio versus throttle opening for different operating conditions of simple carburetor and explain salient features	**[14M]**
	b)	Explain the process of combustion in C.I. Engines and also explain the various stages of combustion.	
	OR		
4	a)	Explain the various factors that influence the flame speed.	**[14M]**
	b)	What are the methods to be followed to avoid knocking in SI engine.	

SECTION-III

5	a)	Explain the procedure of Morse test of a four stroke four cylinder petrol engine	**[7M]**
	b)	Write a short notes on Willion's line	**[7M]**
	OR		
6	a)	Explain the details of exhaust gas composition with the percentage of each component.	**[7M]**
	b)	Schematically explain the use of the study of heat balance of an engine?	**[7M]**

SECTION-IV

7	a)	Derive an expression for efficiency of a root blower in terms of pressure ratio and ratio of specific heats.	**[7M]**
	b)	A rotary air compressor compresses 100 kg of air/minute from 1.2 bar and 293 K to 4.8 bar. Find the power required to drive the compressor, if the compression is isentropic and follows $pv^{1.3}$=constant.	**[7M]**
	OR		
8	**a)**	Define and discuss the terms power input factor and adiabatic coefficient with respect to the rotary compressor	**[7M]**
	b)	What is the importance of velocity triangles in power generation? Explain.	**[7M]**

SECTION-V

9 20 m^3 of air per second at 1 bar 15^0C is to be compressed in a centrifugal compressor 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. **[14M]**

OR

10 a)Explain the working principle of axial flow compressor with velocity diagrams **[8M]**

b) An axial flow compressor draws air at 20^0C and delivers it at 50^0C. Assuming 50% reaction, calculate the velocity of flow, if blade velocity is 100 m/s, work factor is 0.85. Take Cp=1kJ/kg.K. Assume $\alpha=10^0$, and $\beta=40^0$, Find the number of stages. **[6M]**

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Code No: R17A0551

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, December 2019

Database Systems

(EEE, ECE & 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)	Describe the client server architecture for the database with necessary diagram.	**[8M]**
	b)	Define Database Management Systems.	**[2M]**
	c)	List out Data base applications.	**[4M]**
		OR	
2	a)	Who are the different database users? Explain their interfaces to database management system.	**[8M]**
	b)	Discuss the main characteristics of the database approach and specify how it differs from traditional file system.	**[6M]**

SECTION-II

3	a)	What are the major components used in E-R diagram design?	**[4M]**
	b)	Explain the terms super key and candidate key with an example.	**[4M]**
	c)	Draw an ER diagram for Hospital management system.	**[6M]**
		OR	
4	a)	Differentiate between where clause and group by clause.	**[4M]**
	b)	Differentiate between primary key and a candidate key.	**[4M]**
	c)	Explain about Entity-Relationship model with an example.	**[6M]**

SECTION-III

5	a)	Explain about the following clauses with example queries. (i) Group by (ii) Order by (iii) Aggregation functions.	**[8M]**
	a)	Consider the following database schema to write queries in SQL Sailor(sid, sname, age, rating) Boats(bid, bname, bcolor) Reserves(sid, bid, day) i) Find the sailors who have reserved a red boat ii) Find the names of the sailors who have reserved at least two boats iii) Find the colors of the boats reserved by 'Mohan'.	**[6M]**
		OR	
6	a)	What is a join? Discuss different types of joins.	**[8M]**
	b)	Distinguish between independent and correlated nested queries. Provide appropriate examples to support your explanation.	**[6M]**

SECTION-IV

7	a)	Explain the concept of functional dependency with an example.	**[6M]**
	b)	Explain 3NF & BCNF. What is the difference between them?	**[6M]**
	c)	Write short note on Multi-valued dependencies.	**[2M]**
		OR	
8	a)	List all referential-integrity constraints that should be present in the first and fourth normal form.	**[6M]**
	b)	Why normalization is needed? Explain the process of normalization.	**[8M]**

SECTION-V

9	a)	What is a recoverable schedule? Why is recoverability of schedules desirable? Are there any circumstances under which it would be desirable to allow nonrecoverable schedules? Explain your answer.	**[8M]**
	b)	Draw a state diagram and discuss the typical states that a transaction goes through during execution.	**[6M]**
		OR	
10	a)	List the ACID properties. Explain the usefulness of each.	**[6M]**
	b)	What is meant by the concurrent execution of database transactions in a multiuser system? Discuss why concurrency control is needed, and give informal examples.	**[8M]**

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Code No: R17A0307 **R17**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOI

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, December 2019

Dynamics of Machinery

(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) What do you understand by gyroscopic stabilization? **[4M]**

b) A gear engine automobile is traveling along a curved track of 120m radius. Each of the four wheels has a moment of inertia of 2.2kg-m^2 and an effective diameter of 600mm. The rotating parts of the engine have a moment of inertia of 1.25kg-m^2. The gear ratio of the engine to the back wheel is 3:2. The engine axis is parallel to the gear axle and the crank shaft rotates in the same sense as the road wheels. The mass of the vehicle is 2,050kg and the center of mass is 520mm above the road level. The width of the track is 1.6m. What will be the limiting speed of the vehicle if all the four wheels maintain contact with the road surface? **[10M]**

OR

2 a) What is the gyroscopic effect of rolling of a ship? **[4M]**

b) A racing car weighs 20 k N. It has a wheel base of 2m, track width 1m and height of C.G. 300mm above the ground level and lies midway between the front and rear axle. The engine flywheel rotates at 3000 rpm clockwise when viewed from the front. The moment of inertia of the flywheel is 4 kg-m^2 and moment of inertia of each wheel is 3kgm^2. Find the reactions between the wheels and the ground when the car takes a curve of 15 m radius towards right at 30 km/hr, taking into consideration the gyroscopic and the centrifugal effects. Each wheel radius is 400mm. **[10M]**

SECTION-II

3 **a)** Explain the significance of friction in braking. **[4M]**

b) The turning moment diagram for a petrol engine is drawn to a vertical scale of 1mm=1500 N-m and a horizontal scale of 1mm = 5°. The turning-moment diagram repeats itself after every half revolution of the crankshaft. The areas above and below the mean torque line are 260, -580, 80, -380, 870 and -250mm^2. The rotating parts have a mass of 60 Kg and radius of gyration of 2.5m. If the engine speed is 1600rpm, determine the coefficient of fluctuation of speed **[10M]**

OR

4 A multi-plate clutch has 6 active friction surfaces. The power transmitted is 20kW at 400 rpm. Inner and outer radii of the friction surfaces are 90 and 120 mm respectively. Assuming uniform wear with a coefficient of friction 0.3, find the maximum axial intensity of pressure between discs **[14M]**

SECTION-III

5 a) Define coefficients of steadiness and fluctuation of energy. **[4M]**

b) The torque at the crank shaft of an engine is given by the equation, T = (5000 + 1500 sin3Θ) N m, where Θ is the crank angle. The mean engine speed is 300 rpm and the moment of inertia of the flywheel is 300 rpm. **[10M]**

Determine the power of the engine and the maximum fluctuation of speed of the flywheel, when the resisting torque is constant. Also find the fluctuation of speed if the resisting torque is (5000 + 600 sin Θ)

OR

6 A band brake acts on the ¾ or circumference of a drum of 450 mm diameter, which is keyed to the shaft. The band brake provides a braking torque of 225 Nm. One end of the band of the band is attached to a fulcrum pin of the lever and the other end to a pin 100mm from the fulcrum. If the operating force is applied at 500 mm from the fulcrum and the coefficient of friction is 0.25, find the operating force when the drum rotates in the (i) anticlockwise direction and (ii) clockwise direction **[14M]**

SECTION-IV

7 A,B,C and D are four masses carried by a rotating shaft at radii 100mm, l50mm, 150 mm and 200 mm respectively. The planes in which masses rotate are spaced at 500 mm apart and the magnitude *of* the masses B, C and D are 9 kg, 5 kg and 4 kg respectively. Find the required mass of A and the relative angular settings *of* the 4 masses so that the shaft shall be in complete balance. **[14M]**

OR

8 **a)** Determine the natural frequency of mass of 10 kg suspended at the bottom of two springs of stiffness: 5N/mm and 8N/mm in series. **[4M]**

b) Four masses A, B, C and D are completely balanced. Masses C and D make angles of 90^0 and 210^0 respectively with B in the same sense. The planes containing B and C are 300 mm apart. Masses A, B, C and D can be assumed to be concentrated at radii of 360 mm, 480 mm, 240 mm and 300 mm respectively. The masses B, C and D are 15 kg, 25 kg and 20 kg respectively. Determine i) mass A and its angular position ii) position of planes A and D. **[10M]**

SECTION-V

9 **a)** Define sensitiveness. Why too sensitive governors are not useful? **[4M]**

b) In a Porter governor, the arms and links are each 25cm long and intersect on the main axis. Each ball weighs 45N and the central load is 200N. The sleeve is in its lowest position when the arms are inclined at 30^0 to the axis. The lift of sleeve is 5cm. What is the force of friction at the sleeve, if the speed at ascent from the lowest position is equal to the speed at the beginning of descent from the highest position? What is then the range of speed, all other things remaining the same? **[10M]**

OR

10 **a)** What is meant by hunting of governors? **[4M]**

b) A governor of the Hartnell type has ball arm and sleeve arm of lengths 125mm and 62.5mm respectively; the fulcrum of the bell crank lever being 100mm away from spindle axis. The governor runs at a mean speed of 300rpm, each ball has a mass of 2.3kg, and a 3 percent reduction in speed causes a sleeve movement of 6mm. If the ball-arm is vertical at the mean speed, and gravitational effects are ignored, find the spring stiffness in N/m. Neglect the mass of the arms. By how much must the adjusting nut be screwed down to render the governor isochronous and what will be the resulting operational speed of the governor? **[10M]**

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Code No: R17A0309

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, December 2019

Fluid Mechanics and Hydraulic Machinery

(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	Give the relationship among the pairs of properties of fluid given below.	**[3M]**
	i. Mass density and specific weight.	**[3M]**
	ii. Specific weight and specific volume.	**[4M]**
	iii. Dynamic viscosity and kinematic viscosity.	**[4M]**
	iv. Specific weight and specific gravity.	
	OR	
2	A venturimeter is to be fitted in a pipe of 0.20m diameter where pressure head is 8 m of flowing fluid and the maximum flow is 8000 litres per minute. Find the least diameter of the throat to ensure that the pressure head does not become negative. Take coefficient of discharge as 0.96.	**[14M]**

SECTION-II

3	(a) Define and distinguish between steady flow and uniform flow. Give two examples of each flow.	**[8M]**
	(b) Define stream line and derive the equation of a stream line.	**[6M]**
	OR	
4	(a) What is Euler's equation of motion? Derive Bernoulli's equation from Euler's equation. Discuss the assumptions made.	**[10M]**
	(b) Under what conditions a stream line coincides with a streak line.	**[4M]**

SECTION-III

5	(a) Differentiate between major loss and minor losses. List out the minor losses in closed conduit flow and discuss their significance.	**[8M]**
	(b) Derive the Darcy Weisbach equation.	**[6M]**
	OR	
6	(a) How does a boundary layer produce momentum change? How is this related to the boundary resistance.	**[8M]**
	(b) Describe the characteristic properties of laminar boundary layer.	**[6M]**

SECTION-IV

7	Why is the end of a reaction turbine always kept below the tail water when compared with an impulse turbine? Compare the functions of casings of impulse turbine and reaction turbine.	**[14M]**
	OR	
8	(a) Explain the characteristic curves of the turbines	**[8M]**
	(b) A Pelton wheel develops 2000 Kw under a head of 100 meters while running at 200 rpm and discharging 2500 lit/sec find the unit power, unit speed and unit discharge.	**[6M]**

SECTION-V

9	Explain the working of a reciprocating pump with a neat diagram. Derive the expressions for discharge and work done.	**[14M]**
	OR	
10	Explain about the performance characteristics of centrifugal pumps.	**[14M]**

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Code No: R17A0061 **R17**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOI

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, December 2019

Managerial Economics and 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 the Managerial economics. Explain the nature and scope of managerial economics. **[14M]**

OR

2 What is demand forecasting? Explain the Methods of demand forecasting. **[14M]**

SECTION-II

3 a) Define internal economies of scale. **[7M]**

b) From the following particulars, Find out **[7M]**
Selling Price Rs 200 per Unit
Variable cost Rs 100 per unit
Total Fixed cost Rs 96,000
I) Break even units and value II) Sale to earn a profit of Rs 20,000.

OR

4 a) Explain the significance of CVP analysis in managerial decision making. **[7M]**

b) Explain the Cobb-Douglas production function. **[7M]**

SECTION-III

5 Define monopolistic competition. Explain its characteristics in detail. **[14M]**

OR

6 What is pricing? Explain different methods of pricing. **[14M]**

SECTION-IV

7 a) What is Capital Budgeting? Explain the significance of Capital Budgeting. **[7M]**

b) Discuss the Traditional methods of Capital Budgeting. **[7M]**

OR

8 a) Write about Trading and Profit and Loss account statements. **[7M]**

b) What do you understand by working capital cycle & mention its importance? **[7M]**

SECTION-V

9 a) Define the term Capital budgeting and Explain the steps involved capital budgeting process. **[7M]**

b) Write about Liquidity ratios and Profitability ratios. **[7M]**

OR

10 a) Explain the significance of ratio analysis in evaluating the performance of companies. **[7M]**

b) Enumerate the features of Capital budgeting? List out the methods of capital budgeting with suitable examples. **[7M]**

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Code No: **R17A0311**

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, December 2019

Production Technology

(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

Q. No. 1 Write about centrifugal casting and its types with neat sketches. **[14M]**

OR

Q. No. 2 Explain the working principle of shell mould casting, hot chamber and cold chamber die casting process. **[14M]**

SECTION-II

Q. No. 3 Write about thermit welding process in detail with neat sketch, also write about its advantages, disadvantages and applications. **[14M]**

OR

Q. No. 4 a) Why do we do the edge preparation before welding? What are the different ways of edge preparation techniques? **[7M]**

b) Write primary and secondary combustion equations in oxy-acetylene gas welding process. Is it an endothermic process or exothermic process? **[7M]**

SECTION-III

Q. No. 5 a) Explain recrystallization and grain growth processes and their effect on properties of a metal worked component. **[8M]**

b) Explain the selection of optimum hot working temperature. **[6M]**

OR

Q. No.6 a) What are different press working operations? Classify them. **[8M]**

b) Explain with a neat sketch roll bending. **[6M]**

SECTION-IV

Q. No. 7 a) Briefly explain hydroforming with a neat sketch. **[8M]**

b) Elucidate process variables in explosive forming. **[6M]**

OR

Q. No. 8 a) Distinguish between wire drawing and tube drawing with sketches. **[8M]**

b) Differentiate Blanking and Piercing operations in detail. **[6M]**

SECTION-V

Q. No. 9 Write about extrusion process and its types with neat sketch, also write about its advantages, disadvantages and applications **[14M]**

OR

Q. No. 10 What are the characteristics of any forging machine? Explain the process of closed die forging. Explain the importance of flash. **[14M]**

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Code No: R17A0308

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, December 2022

Thermal Engineering

(ME)

Roll No										

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

***

SECTION-I

1 Define volumetric efficiency and Discuss the effect of various factors affecting the volumetric efficiency. **[14M]**

OR

2 Compare four-stroke and two-stroke cycle engines. Bring out clearly their relative merits and demerits. **[14M]**

SECTION-II

3 Bring out clearly the process of combustion in CI engines and also explain the various stages of combustion. **[14M]**

OR

4 What is Delay period and what are the factors that affect the Delay period? **[14M]**

SECTION-III

5 State the limitations experienced in the evaluation of friction power using willan's line method. **[14M]**

OR

6 The following observations have been made from the test of a four-cylinder,two-stroke gasoline engine. Diameter =10cm;stroke=15cm; speed=1600rpm;Area of the positive loop of the indicator diagram=5.57 sq cm; Area of the negative loop of the indicator diagram= 0.25sq cm; Length of the indicator diagram=55mm;spring constant =3.5bar/cm; Find the indicated power of the engine. **[14M]**

SECTION-IV

7 Explain with a neat sketch the actual P-V diagram for a Two-Stage Compressor. **[14M]**

OR

8 Describe with a neat sketch the construction and working of a Two-stage single-acting reciprocating air compressor with intercooling. **[14M]**

SECTION-V

9 What is a Centrifugal Compressor? How does it differ from an Axial Flow Compressor? **[14M]**

OR

10 Describe briefly an Axial-Flow Compressor with a neat sketch? **[14M]**

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Code No: R17A0551

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, December 2022

Database Systems

(ME & ECE)

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 Explain the architecture of DBMS with a neat sketch. List out the functionalities of Database users. **[14M]**

OR

2 Explain database users, user interfaces, DBA and functions of a DBA. **[14M]**

SECTION-II

3 Explain how to build ER model for university with entities department, instructor, student, and class. Instructors and students belong to one department only. Instructors and students related to a class with many to many relations. Assume suitable attributes. Explain how the ER model can be translated to relations **[14M]**

OR

4 List and explain the design issues of entity relationship. Draw an E-R diagram for a core banking enterprise system and identify the derived and composite attributes, the strong and weak entity sets, and relationships. **[14M]**

SECTION-III

5 Consider the following schema **[14M]**
instructor (ID, name, dept_name),
teaches (ID, course_id, sec_id, semester, year),
section (course_id, sec_id, semester, year),
student (ID, name, dept_name),
takes (ID, course_id, sec_id, semester, year, grade)
Write the following queries in SQL
a) Find the names of the students not registered in any section
b) Find the names of the instructors not teaching any course
c) Find the total number of courses taught department wise
d) Find the total number of courses registered department wise

OR

6 How would you use the operators IN, EXISTS, UNIQUE, ANY and ALL in writing nested queries? Why are they useful? Explain with an example **[14M]**

SECTION-IV

7 Illustrate 1NF and 2NF with examples? Why is a table whose primary key consists of a single attribute automatically in 2NF when it is in 1NF? Explain. **[14M]**

OR

8	What is normalization? Analyze 4NF and 5NF Normal forms with clear examples	**[14M]**

SECTION-V

9	Explain transaction states and desirable properties. How to test serializability of a schedule? Illustrate with examples.	**[14M]**

OR

10	How to implement Isolation. When a transaction is rolled back under timestamp ordering, it is assigned a new timestamp. Why can it not simply keep its old timestamp?	**[14M]**

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Code No: R17A0307

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLC

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, December 2022

Dynamics of Machinery

(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 Explain the effect of the gyroscopic couple on the reaction of the four wheels of a vehicle negotiating a curve. **[14M]**

OR

2 An aeroplane makes a complete half circle of 50 metres radius, towards left, when flying at 200 km per hour. The rotary engine and the propeller of the plane has a mass of 400 kg with a radius of gyration of 300 mm. The engine runs at 2400 r.p.m. clockwise, when viewed from the rear. Find the gyroscopic couple on the aircraft and state its effect on it. What will be the effect, if the aeroplane turns to its right instead of to the left? **[14M]**

SECTION-II

3 Describe with a neat sketch a centrifugal clutch and deduce an equation for the total torque transmitted. **[14M]**

OR

4 A cone clutch is to transmit 7.5 kW at 900 r.p.m. The cone has a face angle of 12º. The width of the face is half of the mean radius and the normal pressure between the contact faces is not to exceed 0.09 N/mm^2. Assuming uniform wear and the coefficient of friction between contact faces as 0.2, find the main dimensions of the clutch and the axial force required to engage the clutch. **[14M]**

SECTION-III

5 Describe the construction and operation of a prony brake absorption dynamometer with a neat sketch. **[14M]**

OR

6 A single cylinder double acting steam engine develops 150 kW at a mean speed of 80 r.p.m. The coefficient of fluctuation of energy is 0.1 and the fluctuation of speed is ± 2% of mean speed. If the mean diameter of the flywheel rim is 2 metre and the hub and spokes provide 5% of the rotational inertia of the flywheel, find the mass and cross-sectional area of the flywheel rim. Assume the density of the flywheel material (which is cast iron) as 7200 kg/m^3. **[14M]**

SECTION-IV

7 Derive an expression for the natural frequency of free longitudinal vibrations of a spring mass system by equilibrium method. **[14M]**

OR

8	The reciprocating mass per cylinder in a 60° V-twin engine is 1.5 kg. The stroke and connecting rod length are 100 mm and 250 mm respectively. If the engine runs at 2500 r.p.m., determine the maximum and minimum values of the primary and secondary forces. Also find out the crank position corresponding these values.	**[14M]**

SECTION-V

9	A loaded Porter governor has four links each 250 mm long, two revolving masses each of 3 kg and a central dead weight of mass 20 kg. All the links are attached to respective sleeves at radial distances of 40 mm from the axis of rotation. The masses revolve at a radius of 150 mm at minimum speed and at a radius of 200 mm at maximum speed. Determine the range of speed.	**[14M]**

OR

10	Explain the term height of the governor. Derive an expression for the height in the case of a Watt governor. What are the limitations of a Watt governor?	**[14M]**

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Code No: R17A0309

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, December 2022

Fluid Mechanics and Hydraulic Machinery

(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) Classify different types of manometers **[7M]**

b) Explain U-Tube manometer with neat sketch. **[7M]**

OR

2 Describe giving a sketch, a micro manometer. Explain how it could be used for measuring small pressure difference. **[14M]**

SECTION-II

3 What are the different types of fluid flow? Explain with examples **[14M]**

OR

4 a) What are the different types of flow lines? Discuss. **[6M]**

b) State Bernoulli's theorem for steady flow of an incompressible fluid. Derive an expression for Bernoulli's equation from first principle and state the assumptions made for such a derivation. **[8M]**

SECTION-III

5 a) Describe Reynolds experiment with a legible sketch. What are the outcomes of Reynolds experiment? **[7M]**

b) Two tanks are connected by a 300 mm diameter 1000 m long pipe. Find the rate of flow if the difference of water level in the tank is 10 m. Take 4f = 0.04 and ignore minor losses. **[7M]**

OR

6 Find the displacement thickness, the momentum thickness, and energy thickness for the velocity distribution in the boundary layer given by $\frac{u}{U} = 2\left(\frac{y}{\delta}\right) - \left(\frac{y}{\delta}\right)^2$ **[14M]**

SECTION-IV

7 Kaplan turbine develops 24647.6kW power at an average head of 39meters. Assuming a speed ratio of 2, flow ratio of 0.6, diameter of the boss equal to 0.35 times the diameter of the runner and an overall efficiency of 90%, calculate the diameter, speed and specific speed of the turbine. **[14M]**

OR

8 Explain performance characteristics curves of turbines? **[14M]**

SECTION-V

9 a) Explain the working principle of a centrifugal pump with the help of a neat sketch. **[7M]**

b) Differentiate between single acting and double acting reciprocating pump. **[7M]**

OR

10 A centrifugal pump has external and internal impeller diameters as 600mm and 300mm respectively. The vane angle at inlet and outlet are 30^0 and 45^0 respectively. If the water enters the impeller at 2.5m/s, find **[14M]**

i. speed of the impeller in rpm,

ii. work done per kN of water.

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Code No: R17A0061

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, December 2022

Managerial Economics and Financial Analysis

(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 Discuss in detail nature and scope of managerial Economics **[14M]**

OR

2 Explain Law of demand and its exceptions with examples **[14M]**

SECTION-II

3 Explain law of variable proportions with graph. Explain marginal product, Average product and total product in connection to the law **[14M]**

OR

4 Explain cost output relationship in short run and long run **[14M]**

SECTION-III

5 Explain types of markets and features of perfect competition **[14M]**

OR

6 Explain the stages of formation of a company in detail **[14M]**

SECTION-IV

7 Explain methods and sources of raising finance **[14M]**

OR

8 Journalize the following transactions and post them into Ledgers **[14M]**

Jan 1. Commenced business with a capital of Rs. 10000
,, 2. Bought Furniture for cash Rs. 3000
,, 3. Bought goods for cash from 'B' Rs. 500
,, 4. Sold goods for cash to A Rs. 1000
,, 5. Purchased goods from C on credit Rs.2000
,, 6. Goods sold to D on credit Rs. 1500
,, 8. Bought machinery for Rs. 3000 paying Cash
,, 12. Paid trade expenses Rs. 50
,, 18. Paid for Advertising to Apple Advertising Ltd. Rs. 1000
,, 19. Cash deposited into bank Rs. 500
,, 20. Received interest Rs. 500
,, 24. Paid insurance premium Rs. 200
,, 30. Paid rent Rs. 500
30. Paid salary to P Rs.1000

SECTION-V

9 Explain about features of capital budgeting **[14M]**

OR

10 Explain liquidity, profitability ratios with formulae **[14M]**

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Code No: R17A0308

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2021

Thermal Engineering

(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) What is the use of air standard cycle? List some air standard cycles b) Compare actual and fuel-air cycles of IC engines	**[7+7M]**
2	a)compare diesel engines with petrol engines b)Explain the working of four stroke petrol engine with a neat sketch	**[7+7M]**
3	a)What are knock limited parameters in case of combustion engines b)Differentiate between battery ignition system and magneto ignition system	**[7+7M]**
4	a) What is knocking in diesel engine? explain detail b)What are the factors that influence the flame speed in SI engine	**[7+7M]**
5	The following data refer to 2-stroke oil engine: Bore=100mm Stroke=150mm Piston speed=300m/min Torque developed=60N-m Mechanical efficiency=90% Indicated thermal efficiency =42% C.V=45500kj/kg Find: indicated power, indicated mean effective pressure, Brake-Specific fuel consumption ,Friction Power	**[14M]**
6	A four stroke petrol engine has fuel consumption of 0.3kg/Kwhr of brake power. Fuel has calorific value 42000KJ/kg. Engine's Mechanical efficiency is 80%,Brake power is 20KW and air/fuel ratio is 16.caluculate indicated power, frictional power mass flow rate of fuel in kg/hr, mass flow rate of air in kg/hr ,indicated thermal efficiency and brake thermal efficiency	**[14M]**
7	a)Explain the working of Roots blower with the help of neat sketch b)Derive an expression for minimum work required for two stage reciprocating air compressor with perfect inter cooling	**[7+7M]**
8	a)With the help of velocity triangles derive the expression for power required to run a single stage axial flow compressor b)Define polytropic efficiency of an axial flow compressor	**[10+4M]**

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Code No: R17A0551

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

R17

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2021

Database Systems

(EEE, ECE& ME)

Roll No										

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

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

1	How are the following handled in ER data modelling (i)Multivalued attributes (ii) Composite attributes (iii)Derived attributes (iv) Total and partial participation (v)Week entity set	**[14M]**
2	(i)Explain the distinctions between primary key, candidate key and superkey (ii) State 4 advantages and 2 disadvantages of DBMS.	**[14M]**
3	Write SQL statements for following: Student(Enrno, name, courseId, emailId, cellno) Course(courseId, course_nm, duration) (i)Add a column city in student table. (ii) Find out list of students who have enrolled in "computer" course. (iii) List name of all courses with their duration. (iv) List name of all students start with "a". (v) List email Id and cell no of all mechanical engineering students.	**[14M]**
4	Explain the various types of joins in SQL with the help of an example	**[14M]**
5	Suppose that we decompose the schema R=(A,B,C,D,E) into (A,B,C) (A,D,E) Show that this decomposition is lossless-join decomposition but not dependency preserving if the following set F of functional dependencies holds A→BC, CD→E, B→D, E→A.	**[14M]**
6	(i)What is the difference between BCNF and 3NF? (ii)What is multivalued dependency? (iii)Explain 4NF.	**[14M]**
7	(i)What is recoverable schedule? Why is recoverability of schedule desirable? (ii)What is cascadeless schedule? Why is cascadeless schedule desirable?	**[14M]**
8	What is Transaction? Explain different properties of transactions.	**[14M]**

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Code No: **R17A0307**

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLO

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2021

Dynamics of Machinery

(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 ship propelled by a turbine rotor which has a mass of 5 tonnes and a speed of 2100 rpm. The rotor has a radius of gyration of 0.5 m and rotates in a clockwise direction when viewed from the stern. Find the gyroscopic effects in the following conditions: i) The ship sails at a speed of 30 km/h and steers to the left in a curve having 60 m radius. ii) The ship pitches 6 degree above and 6 degree below the horizontal position. The bow is descending with its maximum velocity. The motion due to pitching is simple harmonic and the periodic time is 20 seconds. Iii) The ship rolls and at a certain instant it has an angular velocity of 0.03 rad/s clockwise when viewed from stern.	**[14M]**
2		A four-wheeled trolley car of total mass 2000 kg running on rails of 1.6 m gauge, rounds a curve of 30 m radius at 54 km/h. The track is banked at 8°. The wheels have an external diameter of 0.7 m and each pair with axle has a mass of 200 kg. The radius of gyration for each pair is 0.3 m. The height of centre of gravity of the car above the wheel base is 1 m. Determine, allowing for centrifugal force and gyroscopic couple actions, the pressure on each rail.	**[14M]**
3	a	State and explain D'Alembert's principle.	**[4M]**
	b	The connecting rod of a vertical high-speed engine is 600 mm long between centres and has a mass of 3 kg. Its centre of mass lies at 200 mm from the big end bearing. When suspended as a pendulum from the gudgeon pin axis, it makes 45 complete oscillations in 30 seconds. The piston stroke is 250 mm. The mass of the reciprocating parts is 1.2 kg. Determine the inertia torque on the crankshaft when the crank makes an angle of 140° with top-dead centre. The engine speed is 1500 rpm.	**[10M]**
4	a	What is boundary friction and film lubrication? Explain.	**[7M]**
	b	A screw jack is used to raise a load of 5 tonnes (2 tonne = 9.81 kN). The pitch of single-start square threads used for the screw is 24 mm. The mean diameter is 72 mm. Determine the force to be applied at the end of 1.2 m long handle when the load is lifted with constant velocity and rotate with the spindle. Take it = 0.2. Also find the mechanical efficiency of the jack.	**[7M]**
5		Which of the two assumptions-uniform intensity of pressure or uniform rate of wear, would you make use of in designing friction clutch and why?	**[14M]**
6		Describe with sketches one form of torsion dynamometer and explain with detail the calculations involved in finding the power transmitted	**[14M]**
7		A, B, C and D are four masses carried by a rotating shaft at radii 100 mm, 150 mm, 150 mm and 200 mm respectively. The planes in which the masses rotate are spaced at 500 mm apart and the magnitude of the masses B, C and D are 9 kg, 5 kg and 4 kg	**[14M]**

respectively. Find the required mass for A, and the relative angular settings of the four masses so that the shaft shall be in complete balance.

8 a Explain the terms Hunting and Stability of a governor. **[4M]**

b A Porter governor has all four arms 200 mm long. The upper arms are pivoted on the axis of rotation and the lower arms are attached to a sleeve at a distance of 25 mm from the axis. Each ball has a mass of 2 kg and the mass of the load on the sleeve is 20 kg. If the radius of rotation of the balls at a speed of 250 rpm. is 100 mm, find the speed of the governor after the sleeve has lifted 50 mm. Also determine the effort and power of the governor. **[10M]**

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Code No: R17A0309

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2021

Fluid Mechanics and Hydraulic Machinery

(ME)

Roll No										

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

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

1	a)Define the following fluid properties (i) weight density (ii)specific Volume (iii)Specific gravity (iv) Density b) What is the difference between dynamic viscosity and kinematic viscosity? State their units of measurements	**[8+6M]**
2	a)What do you mean by single column manometers? How they are used for the measurement of pressure? b) A hydraulic press has a ram of 30cm diameter and a plunger of 5cm diameter. Find the weight lifted by the hydraulic press when the force applied at the plunger is 400N.	**[7+7M]**
3	a) Derive the expression for Bernoulli's equation with help of neat sketch b) Write assumptions for Bernoulli's equation,	**[10+4M]**
4	a)The water is flowing through a taper pipe of length 100m having diameters 600mm at the upper end and 300mm at the lower end, at the rate of 50liters/s. The pipe has a slope of 1 in 30.find the pressure at the lower end if the pressure at the higher level is 19.62N/cm^2 b)what is venturimeter give its applications	**[10+4M]**
5	a) Derive an expression for Jet of water striking on stationary plate at the centre b)Draw the velocity triangle for curved vane striking at tangential to the tip of the plate	**[7+7M]**
6	a) Write the difference between impulse and reaction turbines. b) With the help neat sketch explain the working Pelton wheel	**[4+10M]**
7	In a tidal power plant, a bulb turbine (which is basically an axial flow turbine) operates a 5MW generator at 150 r.p.m. under a head of 5.5m. The generator efficiency is 93% and the overall efficiency of the turbine is 88%. The tip diameter of the runner is 4.5m and hub diameter is 2m. Assuming hydraulic efficiency of 94% and no exit whirl, determine the runner vane angles at inlet and exit at the mean diameter of the vanes	**[14M]**
8	a)Differentiate between turbines and pumps with examples b)Describe the principle and working of a reciprocating pump with a neat sketch	**[7+7M]**

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Code No: R17A0061

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOG

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2021

Managerial Economics and 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 "Managerial economics deals with the application of the economic concepts, theories, tools, and methodologies to solve practical problems in a business" explain with an example and brief on the concepts of micro, macro concepts of economics **[14M]**

2 Elaborate the law of demand, factors governing demand forecasting and brief on the methods of demand forecasting with suitable illustrations. **[14M]**

3 Discuss the form of Cobb-douglas production function which exhibits constant return to scale and elaborate the internal and external economies of scale in production analysis. **[14M]**

4 The operating result of a company for the last Two periods are as follows: **[14M]**

PERIOD	SALES(Rs)	PROFIT(Rs)
I	270000	6000
II	300000	15000

Calculate: 1) P/v ration
2) BEP
3) Sales required to earn a profit of 20000 Rs.
4) Profit when the sales are 500000 Rs.

5 What do you understand by monopoly market structure, brief on the conditions necessary for the existence of monopoly and how are price and output determined under monopoly? **[14M]**

6 Discuss the features of joint stock companies, analyse the problems of the public sector enterprises and suggest remedial measures for their improvement. **[14M]**

7 Explain the main objectives of Accounting and its important functions in Business Success and present the formats for preparation of Trial Balance and Final Accounts. **[14M]**

8 Calculate following ratios from the following information: **[14M]**

(i) Current ratio (ii) Liquid ratio (iii) Operating Ratio (iv) Gross profit ratio

Current Assets Rs. 35,000
Current Liabilities Rs. 17,500
Inventory Rs. 15,000
Operating Expenses Rs. 20,000
Revenue from Operations Rs. 60,000
Cost of Revenue from operation Rs. 30,000

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Code No: R17A0311

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2021

Production Technology

(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 steps involved in casting	**[8+6M]**
	b) list the pattern allowances and explain their significant	
2	a) Write in detail about any five type casting defect with proper diagram.	**[10+4M]**
	b) Explain about core prints	
3	Describe the functions and characteristing of electrodes. What are the functions of coatings? How are electrodes classified?	**[14M]**
4	Explain the following welding process a)TIG welding b)MIG welding	**[7+7M]**
5	a) Distinguish between hot working and cold working b)compare the properties of cold and hot worked parts	**[8+6M]**
6	a)explain the principle of rolling with a neat sketch b)explain the terms of ingot and slab	**[10+4M]**
7	Explain following operations a)Blanking b)piercing c)Bending	**[4+4+6M]**
8	a)Explain with neat sketch of forward extrusion process b)Explain with a neat sketch of hydrostatic extrusion process	**[7+7M]**

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Code No: R17A0308

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNO

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2022

Thermal Engineering

(ME)

Roll No										

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1 (a)	With a neat sketch, explain the working principle of a simple carburetor.	**[7M]**
(b)	Explain the differences between petrol and diesel engines?	**[7M]**

OR

2 (a)	Explain the working principle of thermosyphon cooling system with neat sketch?	**[7M]**
(b)	Describe the working principle of battery ignition system in SI engine with neat sketch?	**[7M]**

SECTION-II

3 (a)	Explain the stages of combustion in CI engine with the help of p-θ diagram?	**[7M]**
(b)	Define octane number and cetane number? And explain its significance?	**[7M]**

OR

4 (a)	Describe different types of combustion chambers used in SI engine?	**[7M]**
(b)	Describe the phenomenon of knocking? Explain different factors affecting the knocking in SI engine.	**[7M]**

SECTION-III

5	Explain the Procedure to prepare heat balance sheet of IC Engine.	**[14M]**

OR

6	A single cylinder 4-stroke cycle oil engine works on diesel cycle. The following readings were taken when the engine was running at full load. Area of the indicator diagram=3 cm^2, Length of the diagram=4 cm, spring constant =10 bar/cm, speed of the engine =400 r.p.m., Diameter of the cylinder=16 cm, stroke of the piston =20 cm, Calorific value of the fuel=42000k J/kg, Load on the brake=380 N, Spring reading= 50N, Fuel consumption=2.8 kg/hr, Diameter of the brake drum=120 cm. From these data find i) F.P, ii) Mechanical efficiency, iii) Brake thermal efficiency, and iv) BMEP.	**[14M]**

SECTION-IV

7	What are the different types of rotary compressors? Describe with neat sketches the working of rotary compressors?	**[14M]**

OR

8 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 250°C. **[14M]**

SECTION-V

9 (a) Write the differences between a) reciprocating and rotary compressors b) centrifugal and axial flow compressors **[6M]**

(b) Define the following slip factor, power input factor, pressure coefficient and adiabatic coefficient? **[8M]**

OR

10 Explain the working principle of centrifugal compressor with the help of schematic diagram and velocity triangles? **[14M]**

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Code No: R17A0307

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2022

Dynamics of Machinery

(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 **[14M]**

The turbine rotor of a ship has mass of 2.2 tonnes and rotates at 1800 rpm in clockwise when viewed from the stern. The radius of gyration of rotor is 320 mm. Determine the gyroscopic couple and its effect when a) The ship turns right at a radius of 250 m with a speed of 25 km/hr b) The ship pitches with the bow rising at an angular velocity of 0.8 rad/sec c) The ship rolls at an angular velocity of 0.1 rad/sec.

OR

2 A gear engine automobile is traveling along a curved track of 120 m radius. Each of the four wheels has a moment of inertia of 2.3 kg-m 2 and an effective diameter of 600 mm. The rotating parts of the engine have a moment of inertia of 1.25 kg-m^2. The gear ration of the engine to the back wheel is 3:2 the engine axis is parallel to the gear axle and the crank shaft rotates in the same sense as the road wheels. The mass of the vehicle is 2,050 kg and the center of mass is 520 mm above the road level. The width of the track is 1.6m. What will be the limiting speed of the vehicle if all the four wheels maintain contact with the road surface? **[14M]**

SECTION-II

3 A plain collar type thrust bearing having inner and outer diameters of 200mm and 450mm is subjected to an axial thrust of 50KN. Assuming coefficient of friction between the thrust surfaces as 0.3, find the power absorbed in overcoming friction at a speed of 240rpm. The rate of wear is considered to be proportional to the pressure and rubbing speed. **[14M]**

OR

4 A single plate clutch is required to transmit 150KW at 6000rpm. The clutch facings available provide a coefficient of friction of 0.25, and the average pressure is to be limited to 75KN/m^2. Determine the dimensions of the working of single plate clutch plate if its maximum dimension is not to exceed 160mm. **[14M]**

SECTION-III

5 A differential band brake has an angle of contact of 225°, one end of band is **[14M]**

attached to a pin 150mm from the fulcrum of the lever, and the other end to another pin 35mmfrom the fulcrum on the other side of it, where vertically downward force acting at a distance of 500mm from the fulcrum. The brake is to sustain a torque of 350N-m and the coefficient of friction between the band and the drum is 0.3. find i) the necessary force F acting vertically downward at the end of the lever for the clockwise and counter - clockwise rotation of the drum and ii) the distance of the first pin from the fulcrum for the brake to be self-locking, when the drum rotates clockwise.

OR

6 Find i) The power of the engine, when speed is 120rpm ii) The moment of inertia of the flywheel if the speed variation is not to exceed 0.6% of the mean speed. ± 0.6% iii) The angular acceleration of the fly wheel when the crank has turned through 45^0 from IDC when the turning moment requirement of a machine is represented by the equation T= (1000+400sin2θ-250 cos2θ) Nm, where θ is the angle turned by the crank shaft of the machine and the supply torque is constant. **[14M]**

SECTION-IV

7 A two cylinder uncoupled locomotive has inside cylinders 0.6 m apart, the radius of each crank is 275mm and they are at right angles. The revolving mass per cylinder is 340 kg and the reciprocating mass per cylinder is 370 kg. The whole of the revolving and two third of the reciprocating masses are to be balanced and the balanced masses are placed, in the planes of rotation of the driving wheel at a radius of 0.65 m. The driving wheels are of 1.8 m in diameter and 1.45m apart. If the speed of the engine is 100kmph, find the hammer blow, maximum variation in tractive effort and maximum swaying couple. **[14M]**

OR

8 Find the frequency of transverse vibrations of a shaft which is simply supported at the ends and is of 40mm in diameter. The length of the shaft is 5 m. The shaft carries three point loads of masses 15 kg, 35 kg and 22.5 kg at 1 m, 2 m and 3.4 m respectively from the left support. The Young's modulus for the material of the shaft is 200 GN/m2. The weight of the shaft is 18.394 N per meter length. **[14M]**

SECTION-V

9 In a spring loaded governor of the hartnell type, the mass of each ball is 5 kg and the lift of the sleeve is 50 mm the speed at which the governor begins to float is 240 rpm and at this speed the radius of the ball path is 110 mm, the mean working speed of a governor is 20 times the range of the speed when friction neglected. If the length of the ball and roller arm of the bell crank lever are 120 mm and 100 mm respectively, if the distance between the center of pivot of bell crank lever and axis of the governor spindle is 140 mm. Determine (i) The initial compression of the spring taking into account the obliquity of arms (ii) equilibrium speed corresponding to radius of rotation of 150 mm. **[14M]**

OR

10 The arms of a Porter governor are each 250 mm long and pivoted on the governor axis. The mass of each ball in 5 kg and the mass of the central sleeve is 30 kg. The radius of rotation of the balls is 150 mm when the sleeve begins to rise and reaches a value of 200 mm for maximum speed. Determine the speed range of the governor. If the friction at the sleeve is equivalent of 20 N of load at the sleeve, determine how the speed range is modified. **[14M]**

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Code No: R17A0551

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2022

Database Systems

(EEE, ECE& 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 about data abstraction. **[8M]**

b) Compare and Contrast file Systems with database systems? **[6M]**

OR

2 a) Explain three-tier architecture of DBMS? **[6M]**

b) With a neat diagram explain the various components of a database system and their connections. **[8M]**

SECTION-II

3 Why ER model is used to create an initial design. List all and explain any three steps involved in Database design process. Draw an ER diagram for University Database with at least three entity types and also specify relevant constraints. **[14M]**

OR

4 a) Distinguish strong entity set with weak entity set. Draw an ER diagram to illustrate weak entity set? **[8M]**

b) Explain the about views. **[6M]**

SECTION-III

5 a) Illuminate the following integrity constraints and specify the same in SQL: **[6M]**

i. Key Constraints ii. Foreign key constraints

b) Explain about the outer join operations along with example. **[8M]**

OR

6 a) Discuss about aggregate functions using group by having clause with examples. **[8M]**

b) Consider the following tables: **[6M]**

Employee (Emp_no, Name, Emp_city)

Company (Emp_no, Company_name, Salary)

i. Write a SQL query to display Employee name and company name.

ii. Write a SQL query to display employee name, employee city, company name and salary of all the employees whose salary >10000.

iii. Write a query to display all the employees working in "XYZ" company

SECTION-IV

7 a) Define BCNF? How does BCNF differ from 3NF? Explain with an example. **[8M]**

b) Explain the following **[6M]**

i) Lossless Join ii) Lossless decomposition

OR

8 Define Normal Form. Give its types. Analyse which normal form satisfies multivalued dependency? Explain it with an example. **[14M]**

SECTION-V

9 a) What is recoverable schedule? Why is recoverability of schedules desirable? Are there any circumstances under which it would be desirable to allow non – recoverable schedules? **[9M]**

b) Illustrate concurrent execution of transaction with examples? **[5M]**

OR

10 a) How the use of 2PL would prevent interference between the two transactions. **[6M]**

b) Explain the difference between strict 2PL and rigorous 2PL? **[8M]**

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Code No: R17A0309

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLO

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2022

Fluid Mechanics and Hydraulic Machinery

(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: (i) Liquids and gases, (ii) Real fluid and ideal fluids, (iii) Specific weight and specific volume of a fluid.	**[7M]**
	b)	A Plate of certain oil weighs 40KN. Calculate the specific weight, mass density and specific gravity of this oil.	**[7M]**
		OR	
2	a)	What is difference between U-tube differential manometers and inverted U-tube differential manometers?	**[7M]**
	b)	An inverted differential manometer containing an oil of specific gravity 0.9 is connected to find the difference of pressures at two points of a pipe containing water. If the manometer reading is 40 cm, find the difference of pressures.	**[7M]**

SECTION-II

3	a)	Explain the terms: (i) Path line (ii) Streak line (iii) Stream line and (iv) Stream tube.	**[7M]**
	b)	Define equation of continuity. Obtain the expression for continuity equation for a three dimensional flow.	**[7M]**
		OR	
4	a)	State the momentum equation. How will you apply momentum equation for determining the force exerted by a floating liquid on a pipe bend?	**[7M]**
	b)	A 42^0 reducing bend is connected in a pipe line, the diameters at the inlet and outlet of the bend being 40 cm and 20 cm respectively. Find the force exerted by water on the bend if the intensity of pressure at inlet of bend is 20.00 N/cm^2 . The rate of flow of water is 550 litres/s.	**[7M]**

SECTION-III

5	a)	Explain clearly the concepts of displacement and momentum thickness of a boundary layer.	**[7M]**
	b)	A 1.8 m wide and 5.0 m long plate moves through a stationary air of density 1.22 kg/m^3 and viscosity 1.8×10^{-4} poise at a velocity of 1.75 m/s parallel to its length. Determine the drag force on one side of the plate by assuming i) laminar flow ii) turbulent flow condition.	**[7M]**

OR

6 a) Derive an expression for minor losses due to sudden contraction. **[7M]**

b) What do you understand by total energy line, hydraulic gradient line, pipes in series and pipes in parallel? **[7M]**

SECTION-IV

7 A jet of water 50 mm in diameter and moving with a velocity of 26 m/s is impinging normally on a plate. Determine the pressure on the plate when it is fixed and when it is moving with a velocity of 10 m/s in the direction of the jet. Also determine the work done per second by the jet. **[14M]**

OR

8 a) Define the terms 'unit power', 'unit speed' and 'unit discharge' with reference to a hydraulic turbine. Also derive expressions for these terms. **[7M]**

b) A Pelton wheel has a mean bucket speed of 30 m/s with a jet of water flowing at the rate of 0.8 m^3/s under a head of 250 m. The buckets deflect the jet through an angle of 160^0. Calculate the power delivered to the runner and the hydraulic efficiency of the turbine. Assume co-efficient of velocity as 0.85. **[7M]**

SECTION-V

9 **a)** Define centrifugal pump and explain the working procedure of a single-stage centrifugal pump with neat sketch. **[7M]**

b) A centrifugal pump is to discharge 0.118 m^3/s at a speed of 1450 rpm against head of 25 m. The impeller diameter is 250 mm, its width at outlet is 50 mm and manometer efficiency is 75%. Determine the vane angle at the outer periphery of the impeller. **[7M]**

OR

10 a) With the help of suitable diagram, explain the performance of a reciprocating pumps. **[7M]**

b) What is negative slip in reciprocating pump? Explain with neat sketch the function of air vessel in a reciprocating pump. **[7M]**

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Code No: R17A0311

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2022

Production Technology

(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 Types of patterns in casting process	**[14M]**
	OR	
2	Explain Design of Gating system	**[14M]**

SECTION-II

3	Explain TIG welding process and its applications	**[14M]**
	OR	
4	Classify the welding process and types of welded joints	**[14M]**

SECTION-III

5	Differentiate between Cold working and Hot working method	**[14M]**
	OR	
6	Explain theory of rolling	**[14M]**

SECTION-IV

7	Explain wire drawing process and its advantages	**[14M]**
	OR	
8	Write short note on (a) Piercing (b) Coining	**[14M]**

SECTION-V

9	Classify the extrusion process and explain forward extrusion process	**[14M]**
	OR	
10	Explain smith forging and drop forging process	**[14M]**

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Code No: R17A0061

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2022

Managerial Economics and 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 and discuss about demand determinants, Law of Demand and exceptions to Law of demand. **[14M]**

OR

2 Explain about the survey methods and statistical methods of demand forecasting. **[14M]**

SECTION-II

3 Elaborate about Laws of returns and internal and external economies of scale. **[14M]**

OR

4 A firm has a fixed cost of Rs. 60,000; selling price per unit is Rs. 75 and variable cost per unit is Rs. 35. Present level of production is 2500 units. **[14M]**

(i) Determine break-even point in terms of units and sales revenue.
(ii) Calculate the margin of safety.
(iii) What is the change in break-even point and margin of safety, if fixed costs increase from Rs. 60,000/- to Rs. 80,000/-

SECTION-III

5 Explain about the objectives, policies and methods of pricing of products and services of typical commercial firms. **[14M]**

OR

6 Narrate about the changing business environment in post-liberalization scenario in India. **[14M]**

SECTION-IV

7 What are the various types of capital and how are the Fixed and Working capital requirements estimated? **[14M]**

OR

8 Prepare Trading Account, Profit and Loss Account and Balance Sheet from the following accounting records of M/s. Pavani Enterprises: Capital-64,000/-, Sales 1,74,000/-, Purchases-1,54,000/-, Carriage inwards-1,300/-, Purchase returns-2,000/-, Carriage outwards-1,800/-, Sales returns-4,000/-, Furmiture-600/-, Premises-24,000/-, Motor van-3,000/-, Opening stock-32,000/-, Debtors-26,000/-, Drawings-2,000/- and Creditors-8,700/-. **[14M]**

SECTION-V

9 A business needs a new machine and has to select from machine A and machine B. The initial cost and the net cash flows over five years (income less running **[14M]**

expenses but not depreciation) to the business have been calculated for each machine as follows:

		(in Rs.)
	Machine A	Machine B
Initial cost	20,000	28,000
Net Cash flows		
Year 1	8,000	10,000
Year 2	12,000	12,000
Year 3	9,000	12,000
Year 4	7,000	9,000
Year 5	8,000	9,000

At the end of five years, the machine will have no value and will be scrapped. To finance the machine, the business can borrow money at 10% per annum. Which machine should be chosen under the Net Present Value method?

The Present Value of Re. 1 (P V Factor) at 10% per annum is as follows:

Year	1	2	3	4	5
P V Factor	0.909	0.826	0.751	0.683	0.621

OR

10 From the following particulars of an MNC, calculate liquidity ratios (current ratio and quick ratio): **[14M]**

(Rs. in Crores)

Current Liabilities	**Rs.**	**Current Assets**	**Rs.**
Creditors	200	Stock	250
Bills payable	50	Debtors	125
Outstanding Expenses	50	Cash at Bank	250
		Cash in hand	125
		Prepaid Expenses	50
		Marketable securities	125

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Code No: R17A0551 **R17**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, January 2024

Database Systems

(ME & ECE)

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 levels of abstraction of database?	**[7M]**
	b)Define DBA? Mention the roles and responsibilities?	**[7M]**
	OR	
2	a)Differentiate between file processing system and DBMS?	**[7M]**
	b)What are Functional components of a Database?	**[7M]**

SECTION-II

3	a)Define is Entity set and Relationship set. Explain the symbols used in ER Diagram	**[7M]**
	b)Explain Weak Entity Set?	**[7M]**
	OR	
4	a)What is a view? Explain about views in detail?	**[7M]**
	b) Explain ER Diagram Notations with examples?	**[7M]**

SECTION-III

5	a) What is SQL? What are the usages of SQL?	**[7M]**
	b) What are the subsets of SQL? Compare and contrast equi join and non equi join?	**[7M]**
	OR	
6	a) Explain Nested queries with examples	**[7M]**
	b) Give examples for GROUPBY, HAVING Clause?	**[7M]**

SECTION-IV

7	a) Discuss 1NF, 2NF and 3NF Normal forms with examples?	**[7M]**
	b) Differentiate BCNF and 3NF?	**[7M]**
	OR	
8	a) Define functional dependencies? Explain with example?	**[7M]**
	b) Explain Fifth normal form?	**[7M]**

SECTION-V

9	a) Define Transaction? Write Properties of a Transaction?	**[7M]**
	b) Discuss recoverability?	**[7M]**
	OR	
10	a) Explain concurrent executions with example?	**[7M]**
	b) Draw and explain the state diagram of transaction?	**[7M]**

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R17

Code No: R17A0307

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, January 2024

Dynamics of Machinery

(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)** Define gyroscopic couple and Derive expression for gyroscopic couple. **[7M]**

b) Describe the effect of gyroscopic couple on rolling of ship **[7M]**

OR

2 The rotor of a turbine yatch rotates at 1200rpm clockwise when viewed from stern. The rotor has a mass of 750 kg and radius of gyration of 250mm.Find the maximum gyroscopic couple transmitted to the hull when yacht pitches with a maximum angular velocity of 1 rad/s. What is the effect of this couple? **[14M]**

SECTION-II

3 An effort of 200N is required to just move certain body up an inclined plane of an angle 15°, the force is acting parallel to the plane. If the angle of inclination of the plane. If the angle of inclination of the plane is made 20°, the effort required parallel to the plane is found to be as 230N. Determine the weight of the body and the coefficient of friction. **[14M]**

OR

4 A cone clutch is to transmit 7.5 kW at 900 r.p.m. The cone has a face angle of 12º. The width of the face is half of the mean radius and the normal pressure between the contact faces is not to exceed 0.09N/mm^2. Assuming uniform wear and the coefficient of friction between contact faces as 0.2, estimate the main dimensions of the clutch and the axial force required to engage the clutch. **[14M]**

SECTION-III

5 A simple band brake is applied to a drum of 560mm diameter which rotates at 240 rpm. The angle of contact of the band is 2700. One end of the band is fastened to affixed pin and the other end to the brake lever, 140mm from the fixed pin. The brake lever is 800mm long and is placed perpendicular to the diameter that bisects the angle of contact. Assuming the coefficient of friction as 0.3, determine the necessary pull at the end of the lever to stop the drum if 40Kw of power is being absorbed. Also, find the width of the band of its thickness is 3mm and the maximum tensile stress is limited to 40 N/mm2. **[14M]**

OR

6 A single cylinder single acting four stroke gas engine develops 20kW at 300 rpm. The work done by the gases during the expansion stroke is three times the work done on the gases during the compression stroke, the work done during the suction **[14M]**

and exhaust strokes is negligible. If the total fluctuation of speed is not to exceed ± 2 percent of the mean speed and the turning moment diagram during compression and expansion is assumed to be triangular, find the moment of inertia of the flywheel.

SECTION-IV

7 **a)** Can a single cylinder engine be fully balanced? Justify **[7M]**

b) Differentiate between the unbalanced force caused due to rotating and reciprocating masses **[7M]**

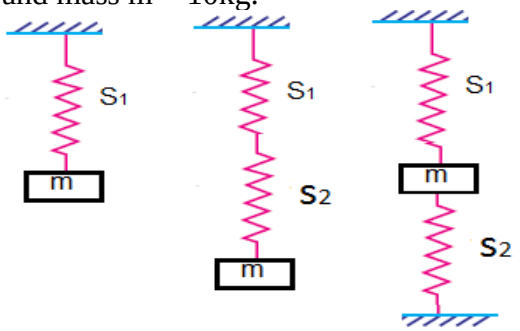
OR

8 Determine the equivalent spring stiffness and the natural frequency of the following vibrating systems when **[14M]**

i) the mass is suspended to a spring one

ii) the mass is suspended at the bottom of two springs in series

iii) the mass is fixed in between two springs, By assuming S_1 = 5 N/mm, S_2 = 8 N/mm and mass m = 10kg.



SECTION-V

9 **a)** Differentiate the open type and cross type Watt governors. **[7M]**

b) Describe the working of a centrifugal governor with the help of neat sketch. **[7M]**

OR

10 All the arms of a Porter governor are 178 mm long and are hinged at 38 mm from the axis of rotation. The mass of each ball is 1.15 kg and mass of the sleeve is 20 kg. The governor sleeve begins to rise at 280 r.p.m. when the links are at an angle of 30° to the vertical. Assuming the friction force to be constant, determine the minimum and maximum speed of rotation when the inclination of the arms to the vertical is 45°. **[14M]**

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R17

Code No: R17A0309

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, January 2024

Fluid Mechanics and Hydraulic Machinery

(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) Deduce the expression for surface tension on a liquid jet. **[7M]**

b) The surface tension of water in contact with air at 20^0C is 0.0725 N/m. The pressure inside a droplet of water is to be 0.02 N/cm^2 greater than the outside pressure. Estimate the diameter of the droplet of water. **[7M]**

OR

2 a) Formulate an expression for inverted U-tube differential manometer. **[7M]**

b) The diameters of a pipe at sections 1 and 2 are 10cm and 15cm respectively. Find the discharge through the pipe if the velocity of water flowing the pipe at section 1 is 5m/s. Estimate the velocity at section 2. **[7M]**

SECTION-II

3 a) A 20cm*10cm venturimeter is inserted in a vertical pipe carrying oil of specific gravity 0.8; the flow of oil is in upward direction. The difference of levels between the throat and inlet section is 50 cm. the oil mercury differential manometer gives a reading of 30 cm of mercury. Find the discharge of oil. Neglect losses. **[7M]**

b) Explicate the flow phonemenon through parallel and series pipes. **[7M]**

OR

4 a) How will you determine the velocity of a fluid at any point with the help of pitot-tube? **[7M]**

b) Distinguish venturi meter and orifice meter. **[7M]**

SECTION-III

5 a) Explain the classification of turbines. **[7M]**

b) Find the displacement thickness, the momentum thickness and energy thickness for the velocity distribution in the boundary layer given by $(u/U)=2(y/\delta)-(y/\delta)^2$. **[7M]**

OR

6 a) Formulate an expression for the force exerted by the jet on an unsymmetrical moving curved plate when jet strikes tangentially at one of the tips. **[7M]**

b) A jet of water having a velocity of 40m/s strikes a curved vane, which is moving with a velocity of 20m/s. the makes an angle of 30^0 with the direction of motion of vane at inlet and leaves at an angle of 90^0 to the direction of motion of vane at outlet. Draw the velocity triangles at inlet and outlet and find the vane angles at inlet and outlet so that the water enters and leaves the vane without shock. **[7M]**

SECTION-IV

7 a) Illustrate the various types of draft tubes. **[7M]**

b) A pelton wheel is having a mean bucket diameter is 1 m and is running at 1000 rpm. The net head on the pelton wheel is 700m. If the clearance angle is 15^0 and discharge through nozzle is 0.1 m^3/s, find (i) power available at the nozzle (ii) hydraulic efficiency of the turbine. **[7M]**

OR

8 a) Elucidate important characteristics curves of hydraulic turbines. **[7M]**

b) Deduce the expressions for unit quantities for the turbines. **[7M]**

SECTION-V

9 a) Enumerate the different types of efficiencies of a centrifugal pump. **[7M]**

b) Formulate the expression for specific speed of centrifugal pump. **[7M]**

OR

10 a) Elucidate the importance of indicator diagram in reciprocating pumps. **[7M]**

b) A single acting reciprocating pump, running at 50 rpm which delivers $0.01m^3/s$ of water. The diameter of the piston is 200 mm and stroke length 400 mm. Estimate (i) theoretical discharge of the pump (ii) co efficient of discharge (iii) slip and percentage of slip of pump. **[7M]**

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Code No: **R17A0061**

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, January 2024

Managerial Economics and Financial Analysis

(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 What is law of demand? State its assumptions and Exceptions in detail? **[14M]**

OR

2 List and explain the demand forecasting methods with suitable examples. **[14M]**

SECTION-II

3 Define production function. Explain the law of Variable Proportion. **[14M]**

OR

4 Describe Breakeven point with the help of diagram and its uses in business decision making. **[14M]**

SECTION-III

5 What is the difference between perfect competition and monopolistic Competition? **[14M]**

OR

6 Explain how price is determined under condition of Monopoly market at equilibrium point. **[14M]**

SECTION-IV

7 What is accounting concepts? Discuss various accounting concepts in detail **[14M]**

OR

8 Journalize the following transactions of 2022 December month. **[14M]**

1.12.2022. Vamsi commenced business with Rs1,00,000
2.12.2022. Deposited Rs. 40,000 with bank.
5.12.2022. Purchased goods worth Rs. 15,000 from Mr.A
10.12.2022. Purchased goods worth Rs. 5,000 from Mr.B
12.12.2022. Sold goods to Mr.Z worth Rs. 8000
15.12.2022. Goods returned by Mr. Z worth Rs. 250
16.12.2022. Returned defective goods worth Rs. 900 to Mr. A.

SECTION-V

9 Examine the discounted cash flow appraisal techniques of capital budgeting. **[14M]**

OR

10 Given the following information regarding cash inflow in respect of the two project proposals. Rank them by applying the criteria of: **[14M]**

i. Payback period
ii. ARR

If Initial investment for both the proposals is Rs.25,000

Years	Proposal I (Rs.)	Proposal II (Rs.)
1	11,750	13,500
2	12,250	12,500
3	12,500	12,250
4	13,500	11,750

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Code No: R17A0308 **R17**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, January 2024

Thermal Engineering

(ME)

Roll No										

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

***

SECTION-I

1(a) Compare the air standard cycles and actual cycles **[7M]**

1(b) Enlist the factors or losses that influence the performance of actual cycles. Sketch the ideal and actual Otto cycle on pressure-volume (p-v) coordinate system. **[7M]**

OR

2(a) Enumerate the differences between two stroke and four stroke engines **[7M]**

2(b) Illustrate the working of splash and pressure lubrication system with a neat sketch **[7M]**

SECTION-II

3(a) Describe different stages of combustion process in spark ignition engines with pressure-crank angle (p-θ) diagram. **[7M]**

3(b) How does the air-fuel ratio and compression ratio affect the flame propagation in spark ignition engines? Elaborate. **[7M]**

OR

4(a) Explain the phenomenon of knock in compression ignition engines. **[7M]**

4(b) Illustrate different types of direct injection type combustion chambers with necessary diagrams. **[7M]**

SECTION-III

5 Explain in detail heat balance sheet for an IC Engines. **[14M]**

OR

6 The following observations were made during the 30 minutes trail of a single-cylinder, four-stroke cycle engine having a cylinder diameter of 18 cm and stroke of 24 cm. Total number of revolutions = 9000, total number of explosions = 4450, mean effective pressure = 5 bar, net load on the brake wheel = 40 kg, effective diameter of the brake wheel = 1 m, total gas used at normal temperature and pressure (NTP) = 2.4 m^3, calorific value of gas at NTP = 19 MJ/m^3, total air used = 36 m^3, pressure of air = 720 mm of Hg, temperature of air = 17^0C, density of air at NTP = 1.29 kg/m^3, temperature of exhaust gasses = 350^0C, room temperature = 17^0C, specific heat of exhaust gasses = 1 kJ/kg K, cooling water circulated 80 = kg, rise in temperature of cooling water = 30^0C. Draw up the heat balance sheet and estimate mechanical and indicated thermal efficiency of the engine. Take gas constant R as 287 J/kg K. **[14M]**

SECTION-IV

7(a)	Differentiate between (i) Single-acting and double-acting compressors (ii) Single-stage and multistage compressors.	**[7M]**
7(b)	Define swept volume, and deduce the it for single cylinder, single-acting compressor having bore d, stroke L and Speed N rpm.	**[7M]**

OR

8(a)	Compare reciprocating and rotary compressors for different aspects of operation	**[7M]**
8(b)	Describe the construction and working of vane-type compressor with necessary diagrams.	**[7M]**

SECTION-V

9	Discuss the principle of operation, construction and working of an centrifugal compressor with necessary diagrams. Also, sketch the variation of pressure and velocity passing through the impeller and diffuser.	**[14M]**

OR

10(a)	Illustrate the construction and working of an axial flow compressor with a neat sketch	**[7M]**
10(b)	Construct combined velocity triangle diagram for axial flow compressor and enumerate the procedure of construction.	**[7M]**

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Code No: R17A0308

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, June 2022

Thermal Engineering

(ME)

Roll No										

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

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

***

1	Briefly explain the following (i) time loss factor (ii) heat loss factor (iii) exhaust blowdown factor.	**[14M]**
2	With neat sketches explain the working principle of four-stroke spark-ignition engine.	**[14M]**
3	Explain the stages of combustion in CI engines.	**[14M]**
4	Explain the effect of various engine variables on SI engine knock.	**[14M]**
5	Why Morse test is not suitable for single cylinder engine? Describe the method of finding friction power using Morse test.	**[14M]**
6	A single cylinder engine running at 2000 rpm develops a torque of 8 Nm. The indicated power of the engine is 2.2 kW. Find the loss due to friction power as the percentage of brake power.	**[14M]**
7	Describe with a neat sketch the construction and working of a single-stage single-acting reciprocating air compressor.	**[14M]**
8	Comparison between centrifugal and axial flow compressors	**[14M]**

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Code No: R17A0551

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLO

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, June 2022

Database Systems

(EEE, ECE& ME)

Roll No										

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

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

***

1 What is data abstraction? Discuss the level of abstraction. **[14M]**

2 Differentiate File Processing System Vs DBMS by considering its notable features. **[14M]**

3 Classify Various types of Keys. Illustarte them with clear examples for each and every key. **[14M]**

4 Construct an Entity-Relationship diagram for a online shopping systems such as Jabong/ Flipcart. Quote your assumptions and list the requirements considered by you for conceptual database design for the above system. **[14M]**

5 Consider the Bank Management System. **[14M]**
account(account_number, branch_name, balance)
branch (branch_name, branch_city, assets)
customer (customer_name customer_street, customer_city)
loan (loan_number, branch_name, amount)
depositor((customer_name, account_number)
borrower(customer_name, loan_number)
Based on the above schema, write the corresponding SQL queries for the following?
i) For all customers who have a loan from the bank, find their names, loan numbers, and loan amount.
ii) Find the customer names, loan numbers, and loan amounts, for all loans at the Perryridge branch.
iii) Find the names of all branches that have assets greater than those of at least one branch located in Brooklyn.
iv) Find the average account balance of those branches where the account balance is greater than Rs. 1200.
v) Find the maximum across all branches of the total balance at each branch.

6 Mention any four SQL Aggregate operators with an example. What is the usage of 'group by' and 'having' clauses in SQL? **[14M]**

7 What is normalization? Explain about 2NF and 3 NF with examples. **[14M]**

8 Explain various anomalies that arise due to interleaved execution of transactions with suitable examples. Discuss about the Two-Phase Locking protocol and its variants **[14M]**

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Code No: R17A0307

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, June 2022

Dynamics of Machinery

(ME)

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

Answer Any **Five** Questions

All Questions carries equal marks.

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1 The turbine rotor of a ship has a mass of 3500 kg. It has a radius of gyration of 0.45 m and a speed of 3000 r.p.m. clockwise when looking from stern. Determine the gyroscopic couple and its effect upon the ship:

A. When the ship is steering to the left on a curve of 100 m radius at a speed of 36 km/h. **[7M]**

B. When the ship is pitching in a simple harmonic motion, the bow falling with its maximum velocity. The period of pitching is 40 seconds and the total angular displacement between the two extreme positions of pitching is 12 degrees. **[7M]**

2 A four-wheeled trolley car of mass 2500 kg runs on rails, which are 1.5 m apart and travels around a curve of 30 m radius at 24 km / hr. The rails are at the same level. Each wheel of the trolley is 0.75 m in diameter and each of the two axles is driven by a motor running in a direction opposite to that of the wheels at a speed of five times the speed of rotation of the wheels. The moment of inertia of each axle with gear and wheels is 18 kg-m^2. Each motor with shaft and gear pinion has a moment of inertia of 12 kg-m^2. The centre of gravity of the car is 0.9 m above the rail level. Determine the vertical force exerted by each wheel on the rails taking into consideration the centrifugal and gyroscopic effects. State the centrifugal and gyroscopic effects on the trolley. **[14M]**

3 Derive from first principles an expression for the friction moment of a conical pivot assuming (*i*) Uniform pressure, and (*ii*) Uniform wear. **[14M]**

4 A single plate clutch (both sides effective) is required to transmit 26.5 kW at 1600 r.p.m. The outer diameter of the plate is limited to 300 mm and intensity of pressure between the plates is not to exceed 68.5 kN/m^2. Assuming uniform wear and a coefficient of friction 0.3, show that the inner diameter of the plates is approximately 90 mm. **[14M]**

5 A band brake acts on the 3/4th of circumference of a drum of 450 mm diameter which is keyed to the shaft. The band brake provides a braking torque of 225 N-m. One end of the band is attached to a fulcrum pin of the lever and the other end to a pin 100 mm from the fulcrum. If the operating force is applied at 500 mm from the fulcrum and the coefficient of friction is 0.25, find the operating force when the drum rotates in the **(a)** anticlockwise direction, and **(b)** clockwise direction. **[14M]**

6 The turning moment diagram for a petrol engine is drawn to the following scales: Turning moment, 1 mm = 5 N-m; crank angle, 1 mm = 1°. The turning moment diagram repeats itself at every half revolution of the engine and the areas above and below the mean turning moment line taken in order are 295, 685, 40, 340, 960, 270 mm^2. The rotating parts are equivalent to a mass of 36 kg at a radius of gyration of 150 mm. Determine the coefficient of fluctuation of speed when the engine runs at 1800 r.p.m. **[14M]**

7 Describe the method of finding the natural frequency of torsional vibrations for a three rotor system. **[14M]**

8 A Proell governor has all the four arms of length 250 mm. The upper and lower ends of the arms are pivoted on the axis of rotation of the governor. The extension arms of the lower links are each 100 mm long and parallel to the axis when the radius of the ball path is 150 mm. The mass of each ball is 4.5 kg and the mass of the central load is 36 kg. Determine the equilibrium speed of the governor. **[14M]**

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Code No: R17A0309

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, June 2022

Fluid Mechanics and Hydraulic Machinery

(ME)

Roll No										

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

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

1 a) State Newton's law of viscosity. Distinguish between Newtonian and Non-Newtonian fluids. **[7M]**

b) Calculate the specific weight, specific mass, specific volume and specific gravity of a liquid having a volume of 6 m^3 and weight of 44 kN. **[7M]**

2 a) For measuring small pressure differences, explain with sketches how an inclined U-tube manometer is used. **[7M]**

b) An inverted differential manometer containing an oil of specific gravity 0.9 is connected to find the difference of pressures at two points of a pipe containing water. If the manometer reading is 40cm, find the difference of pressures. **[7M]**

3 a) Differentiate the following **[7M]**

i. Laminar flow and Turbulent flow.
ii. Compressible flow and incompressible flow.
iii. Steady and unsteady flow

b) Water is flowing through a pipe of 100 mm diameter with an average Velocity of 10 m/s. Determine the rate of discharge of the water in liters/s. Also determine the velocity of water at the other end of the pipe. If the diameter of the pipe is 200 mm. **[7M]**

4 a) Sketch and explain the stream tube. Also write its properties? **[7M]**

b) The water is flowing through a taper pipe of length 100m having diameters 600mm at the upper end and 300mm at the lower end, at the rate of 50 litres/s. The pipe has a slope of 1 in 30. Find the pressure at the lower end if the pressure at the higher level is 19.62 N/cm^2. **[7M]**

5 a) Derive an expression for discharge through Venturi meter. **[7M]**

b) A 200 mm non-standard orifice is installed in 250 mm pipe carrying water. When the flow is 165Ltrs/s, the mercury differential gauge reads 50 mm. Compute the value of coefficient of discharge of the Orifice meter **[7M]**

6 a) Define and explain the following terms **[7M]**

i. Hydraulic gradient line and
ii. Total energy line.

b) Define coefficient of discharge. Discuss how it varies for venturi-meter and **[7M]**

orifice-meter. What factors influence the same?

7 What is meant by specific speed?. Also derive the expression for specific speed of a turbine. **[14M]**

8 a) Classify the reciprocating pumps? **[6M]**
b) Explain with neat sketch working of Reciprocating pump. **[8M]**

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Code No: R17A0061

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, June 2022

Managerial Economics and Financial Analysis

(ME& AE)

Roll No										

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

Answer Any **Five** Questions
All Questions carries equal marks.
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1 What is the origin of Managerial Economics? How Managerial Economics is related with different subject areas? Explain in detail **[14M]**

2 What are the different kinds of elasticity of demand that are relevant to the manager of a firm? Give example of the goods for which price elasticity is zero. **[14M]**

3
a. State and illustrate Cobb-Douglas production function. What are the properties of this function? **[7M]**
b. Define and explain isoquants. What are its properties? **[7M]**

4 Define cost. Explain the different cost concepts used in the process of cost analysis. Give examples of variable costs. **[14M]**

5 Define a Monopoly market? How the Price-Output determination is made under Monopoly Markets? Explain with a diagram. **[14M]**

6 Define the term business? List out the features of a business? Explain Partnership form of organization in detail? **[14M]**

7 Explain different types of capital. Explain working capital cycle. **[14M]**

8
a. What do you mean by capital budgeting? Explain its significance **[4M]**
b. A company has two proposals for consideration (Y&Z). The cost of proposals in both the cases is Rs 5,00,000 each. A discount factor of 10% may be used to evaluate the proposals. The cash flows after taxes are as under. **[10M]**

Year	Proposal Y	Proposal Z
1	1,50,000	60,000
2	2,20,000	1,50,000
3	2,40,000	2,00,000
4	1,80,000	2,50,000
5	1,50,000	3,00,000

Which proposal can be undertaken under NPV?

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Code No: R17A0311

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLO

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, June 2022

Production Technology

(ME)

Roll No										

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

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

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1	What are pattern allowances? Explain various pattern allowances with a neat sketch.	**[14M]**
2	What is casting defect? Explain the different types of defects in casting with a neat sketch.	**[14M]**
3	With sketch, explain the laser beam welding process. Mention advantages and limitation of laser beam welding also give application**.**	**[14M]**
4	With neat sketches categorize in detail welding defects and their causes and remedies.	**[14M]**
5	Explain the terms 'Recovery', 'Recrystallisation' and 'Grain growth'. Give the differences between Recovery and Recrystallisation.	**[14M]**
6	Discuss about the principle and mechanism of rolling with neat sketch.	**[14M]**
7	Explain about hot spinning and cold spinning with a neat sketch and give its applications.	**[14M]**
8	Explain forward extrusion and backward extrusion with neat sketches.	**[14M]**

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Code No: R17A0308

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, October/November 2020

Thermal Engineering

(ME)

Roll No										

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

Answer Any **Four** Questions
All Questions carries equal marks.
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1 a) From the point of view of fuel air cycle analysis how does fuel air ratio effect the efficiency, maximum power, temperature and pressure of the cycle.
b) List out the differences between the SI engine and CI engine.

2 a) Discuss the various factors which affect the ignition timing in SI engine.
b) Draw the valve time diagram of a 4-stroke diesel engine.

3 a) Explain the stages of combustion in SI engines elaborating the flame front propagation.
b) What is delay period and what are the various factors that affect the delay period?

4 a) What is the instrument used for the measurement of knocking? Explain the influence of operating parameters on knocking in S.I. Engines
b) How to create turbulence in C.I. Engine combustion chamber in order to get better mixing air fuel? Explain in detail.

5 Single cylinder four-stroke gas engine has a bore of 180 mm and a stroke of 330 mm and is governed on the hit and miss principle. When running at 400 rpm at full load indicator card are taken which give a working loop mean effective pressure of 6 bar and a pumping loop mean effective pressure of 0.4 bar. Diagrams from the dead cycle give a mean effective pressure of 0.6 bar. When running on no load a mechanical counter recorded 50 firing strokes per minute. Calculate at the full load with regular firing, brake power and the mechanical efficiency of the engine.

6 Develop an expression for the calculation of indicated power of an engine.

7 a) Classify the Rotary compressors and give the salient features.
b) 1 kg of air per second is taken into a root blower compressor at 1 bar and 27^0C. The delivery pressure of air is 1.5 bar. Calculate the motor power required to run the compressor; if mechanical efficiency is 80%.

8 a) Explain the concept of stalling and losses of axial flow compressor
b) Air at 1.01325 bar and 288 K enters an axial flow compressor stage with an axial velocity of 150 m/s. There are no inlet guide vanes. The rotor stage has a tip diameter of 60 cm and a hub diameter of 50 cm and rotates at 100 rps. The air enters the rotor and leaves the stator in the axial direction with no change in its velocity or radius. The air is turned through 30.20 as it passes through the rotor. Assume a stage pressure of 1.2, calculate power required and degree of reaction.

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Code No: R17A0551

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, October/November 2020

Database Systems

(EEE, ECE& ME)

Roll No										

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

Answer Any **Four** Questions

All Questions carries equal marks.

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1	a)	List four significant differences between a file-processing system and a DBMS.
	b)	Explain the History of Database Systems?
2	a)	Explain different types of database users and write the functions of DBA?
	b)	What is Data modeling? Explain relational model.
	c)	Define (i) Entity (ii) Attribute and Explain with examples.
	d)	Discuss abstract view of data with diagram.
3	a)	What is Entity set? and also define Relationship set. List and explain the symbols used to draw ER Diagram.
	b)	What is a relation? Describe the characteristics of a relation.
4	a)	What is a trigger? How to create it? Discuss various types of triggers.
	b)	Explain the goals of ER-Diagram.
	c)	Distinguish strong entity set with weak entity set? Draw an ER diagram to illustrate weak entity set?
5	a)	Where do we need nesting of queries? Give an example.
	b)	List and explain aggregate functions used in SQL with examples.
6	a)	Explain the form of Basic SQL Query.
	b)	Explain any two aggregate functions of SQL.
	c)	What is NULL? What is its importance? How are these values handled in relational model?
7	a)	Explain about Boyce Codd normal form with an example.
	b)	List and explain the inference rules of functional dependencies.
8	a)	What is a transaction? Explain the ACID properties of a transaction.
	b)	Give an example of a serializable schedule with two transactions such that the order in which the transactions commit is different from the serialization order.
	c)	Give an example of Serializability testing.

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Code No: R17A0307

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNC

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, October/November 2020

Dynamics of Machinery

(ME)

Roll No										

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

Answer Any **Four** Questions
All Questions carries equal marks.
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1 a) Deduce an expression for the gyroscopic couple

b) A 2.4 tonne racing car has a wheel base of 2.4 m and a track of 1.4 m. The centre of mass of the car lies at 0.65 m above the ground and 1.4 m from the rear axle. Equivalent mass of engine parts is 150 kg with radius of gyration of 155 mm. The back axle ratio is 5. The engine shaft and flywheel rotate clockwise when viewed from front. Each wheel has a diameter of 0.8 m and moment of inertia of 0.75 kg-m^2. Determine the load distribution on the wheel when the car is rounding a curve of 100 m radius at a speed of 75 km/hr to the left.

2 a) What is meant by angle of heel in case of a moving motor cycle taking a turn?

b) A four wheeled motor car of mass 3000kg as a wheel based 2.5m, track width 1.5m and height of Centre of gravity 600mm above the ground level and lies at 1metre from the front axle. Each wheel has an effective diameter of 0.8m and a moment of inertia of 0.8kg-m^2. The drive shaft, engine flywheel and transmission are rotating at 4 times the speed of road wheel, in a clockwise direction when view from the front, and is equivalent to a mass of 75kg having a radius of gyration of 100mm.If the car is taking a right turn of 60m radius at 60km/h, find the load on each wheel.

3 **a)** What are the conditions for self-locking and overhauling screws?

b) A shaft has a number of collars integral with it. The external diameter of the collars is 400mm and the shaft diameter is 250mm. If the uniform intensity of pressure is 0.35N/mm^2 and it's coefficient of friction is 0.05, estimate i) power absorbed in overcoming friction when the shaft runs at 105 rpm and carries a load of 150KN and ii) number of collars required.

4 **a)** Explain the working of a single plate clutch

b) A centrifugal clutch has four shoes which slide radially in a spider keyed to the driving shaft and make contact with the internal cylindrical surface of a rim keyed to the driven shaft. When the clutch is at rest, each shoe is pulled against a stop by a spring so as to leave a radial clearance of 5 mm between the shoe and the rim. The pull exerted by the spring is then 600 N. The mass centre of the shoe is 160 mm from the axis of the clutch. If the internal diameter of the rim is 400 mm, the mass of each shoe is 8 kg, the stiffness of each spring is 50 N/mm and the coefficient of friction between

the shoe and the rim is 0.3 find the power transmitted by the clutch at 500 rpm.

5 a) What is self -locking and self-energizing brake?

b) A bicycle and rider having a mass of 120 kg and travel at 14 kmph on a level road. A brake is applied to the rear wheel of 900 mm diameter. The pressure on the brake is 110 N and coefficient of friction is 0.05. What will be the distance covered by the bicycle and number of turns taken by its wheel before coming to rest?

6 a) Explain the significance of turning moment diagrams?

b) A horizontal gas engine running at 210 rpm. has a bore of 220mm and a stroke of 440mm. The connecting rod is 924mm long the reciprocating parts weight 20kg.When the crank has turned through an angle of 30° from IDC, the gas pressure on the cover and the crank sides are 500 KN/m^2 and 60 KN/m^2 respectively. Diameter of the piston rod is 40 mm. Determine: a) Turning moment on the crank shaft b) Thrust on bearing c) Acceleration of the flywheel which has a mass of 8kg and radius of gyration of 600mm while the power of the engine is 22KW.

7 **a)** Why do we need two planes to balance different masses rotating in different planes?

b) Four masses m_1, m_2, m_3 and m_4 are 200kg, 300kg, 240kg and 260kg respectively. The corresponding radii of rotation are 0.2m, 0.15m, 0.25m, and 0.3m respectively and the angles between successive masses are 45^0,75^0, and 135^0. Find the position and magnitude of the balance mass required, if its radius of rotation is 0.2m

8 **a)** Explain controlling force curves for spring controlled governors

b) A porter governor has equal arms each 250mm long and pivoted on the axis of rotation. Each ball has a mass of 5kg and the mass of the central load on the sleeve is 25kg. The radius of rotation of the ball is 150mm when the governor begins to lift and 200mm when the governor is at maximum speed. Find the range of speed, sleeve lift, governor effort and power of the governor in the following cases:

a) When the friction at the sleeve is neglected.

b) When the friction at the sleeve is equivalent to 10N.

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Code No: R17A0309

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, October/November 2020

Fluid Mechanics and Hydraulic Machinery

(ME)

Roll No										

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

Answer Any **Four** Questions
All Questions carries equal marks.
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1 A 10cm X 5cm venturimeter with a coefficient of discharge of 0.95 is to be replaced by an orifice meter having a coefficient of discharge of 0.6.If both the manometers are to give the same differential mercury manometer reading for a discharge of 200 litres per second, and the inlet diameter is to remain 10cm,what should be the diameter of orifice?

2 Explain the practical significance of the following liquid properties:

i) Viscosity ii) Capillarity iii) Surface tension

iv) vapor Pressure v) Specific gravity

3 . (a) Derive Euler's equation of motion along a streamline, and hence derive the Bernoulli's theorem.

(b) What are different types of fluid flows? What is the use of stream tube concept?

4 (a) Define and distinguish between steady flow and uniform flow. Give two examples of each flow.

(b) Define streak line and derive the equation of a streak line.

5 (a) Describe an Orifice meter and find an expression for measuring discharge of fluid through a pipe?

(b) Derive an expression for discharge through a venturimeter, using a neat sketch.

6 (a) What do you mean by pipes in parallel connection. What purpose is served by using pipes in parallel connection.

(b) Compare the advantages of using venturimetrs and orifice meters in fluid flow measurements.

7 What is a Surge tank and a fore bay and what are their functions? Describe with neat sketches different types of surge tank?

8 (a) Define Manometric efficiency, volumetric efficiency, mechanical efficiency, overall efficiency as applied to centrifugal pump.

(b) State the significance of indicator diagrams.

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Code No: R17A0061

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLO

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, October/November 2020

Managerial Economics and Financial Analysis

(ME& AE)

Roll No										

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

Answer Any **Four** Questions
All Questions carries equal marks.
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1 a) What do you mean by elasticity of demand? Explain the different types of elasticity of demand?

b) What is meant by demand forecasting? Explain the criteria of a good forecasting method?

2 a) Define managerial economics? Explain the Micro and Macroeconomic concepts.

b) Define the law of demand? What are the exceptions to law of demand?

3 a) Discuss about the Fixed cost Vs Variable cost and Explicit cost Vs Implicit cost

b) Explain the concept of "law of variable proportions".

4 a) Define the opportunity costs? List out its Assumptions and Limitations.

b) A company reported the following results for two periods

Period	Sales	Profit
I	Rs 20,00,000	Rs 2,00,000
II	Rs 25,00,000	Rs 3,00,000

Ascertain the BEP, PV Ratio, Fixed costs and Margin of Safety

5 a) What is Pricing? Explain the different methods of pricing?

b) Distinguish Between Perfect and Imperfect markets?

6 a) What is a Market? Explain in brief the different types of markets.

b) What is business? Elucidate different features of business.

7 a) Define Accounting? What are the principles (Concepts and conventions) of Accounting?

b) Distinguish between Double entry and Single-entry system of Accounting.

8 a) What is ratio analysis? Discuss the different types of Balance sheet ratios.

b) The following are the ratios related to XYZ Co. Ltd

Inventory Holding Period 2 Months
Gross Profit ratio 25%

Gross profit for the current year amounted to Rs 2,00,000. Closing Stock is excess of Rs 40,000 over opening stock. Find out:

i) Sales
ii) Cost of goods sold
iii) Closing stock
iv) Opening stock

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Code No: R17A0311

R17

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, October/November 2020

Production Technology

(ME)

Roll No										

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

Answer Any **Four** Questions
All Questions carries equal marks.
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Q. No. 1 a) What are the materials that are generally used for making patterns? Explain the reasons for their choice.
b) What are the common allowances provided on patterns? Why and how they are provided? Give suitable examples.

Q. No. 2 a) Explain the following with suitable sketches:
(i) Cope and drag pattern (ii) Skeleton pattern.
b) What is the function of riser? What is its preferred shape and briefly write about nucleation and grain growth related to casting?

Q. No. 3 a) With the help of a neat sketch of welding torch explain the oxy acetylene process of welding.
b) Discuss the merits of AC and DC and explain the VI characteristics of arc and power sources.

Q. No. 4 a) List any five welding defects and describe the consequences of those defects and remedies.
b) Can we join dissimilar materials? If so give those process names and describe the basic principle of working.

Q. No. 5 a) Draw the neat sketches of two high, three high, four high, tandem, planetary rolling mills.
b) Why recovery, recrystallization and grain growth are required after plastic deformation of a metal. Explain these processes.

Q. No.6 a) Explain Hot working and Cold working with their advantages and limitations.
b) Briefly explain the working principle and applications of Injection moulding process with a neat sketch.

Q. No. 7 a) How is Tube drawing is carried out? Explain with suitable sketch.
b) Discuss with a neat sketch, the working of cold spinning process.

Q. No. 8 Classify the extrusion process. Explain the backward extrusion and cold extrusion forging operations. Compare cold and hot extrusion.

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