MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous)
B.Tech. V Semester End Examinations
(Common to CE, EEE, ME, ECE, MCT, MME & CSM)

(Model Question Paper)

Subject Title: Business Economics and Financial Analysis   **Subject Code: MS501HS**

Time: 3 hours   Max. Marks: 60

Note: Answer ALL Questions
Part-A (10 x 1 = 10 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
1. a)	Define Business Economics	1	1	1	1
1. b)	What is meant by National Income?	1	1	1	7
	Unit-II				
1. c)	Describe Cross Elasticity of Demand	1	2	2	12
1. d)	What are the Determinants of supply?	1	1	2	7
	Unit-III				
1. e)	Explain Monopolistic Competition	1	2	3	7
1. f)	What is meant by Marginal Cost?	1	1	3	11
	Unit-IV				
1. g)	Describe Accounting Equation	1	2	4	11
1. h)	What is meant by Materiality Convention?	1	1	4	8
	Unit-V				
1. i)	Explain Liquidity	1	2	5	11
1. j)	List Profitability ratios	1	1	5	11

Part-B (5 x 10=50 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
2. a)	Explain different sources of capital.	5	2	1	1
2. b)	Describe the advantages and disadvantages of sole proreitorship.	5	2	1	7
	OR				
2. c)	Explain the nature and scope of Business Economics.	5	2	1	7
2. d)	Differentiate between Private Limited Companies and Public Limited Companies	5	4	1	7
	Unit-II				
3. a)	Describe Law of Demand and its exceptions	5	2	2	11
3. b)	Explain the Determinants of Supply and supply function.	5	2	2	7
	OR2				
3. c)	The quantity demanded for the product X is 30 units, when the price is Rs.15. The quantity demanded increased to 40 units, as price decreased to Rs. 10. Compute Price Elasticity of demand.	5	3	2	2
3. d)	Explain different methods of Demand Forecasting	5	2	2	12
	Unit-III				
4. a)	How can a producer determine the least-cost combination of inputs?	5	1	3	3
4. b)	Differentiate between perfect competition and monopoly competition.	5	4	3	8
	OR				
4. c)	Explain Law of Variable Proportions with the help of graph.	5	2	3	7
4. d)	Describe various Pricing strategies used by modern business organizations.	5	2	3	5
	Unit-IV				
5. a)	Classify the following accounts into various (Personal, Real or Nominal) types of accounts. i) Salary account ii) Outstanding wages account iii) Rent account	5	2	4	11

	iv) Bank account v) Insurance prepaid vi) Drawings account vii) Bad debts account viii) Machinery account ix) Furniture account x) Patents account					
5. b)	Journalise the following transactions: Jan 1, 2021 Commenced with Cash Rs. 8,00,000 Jan 3, 2021 Purchased Goods worth Rs. 1,50,000 Jan 8, 2021 Sold Goods to Mr. Ramu Rs. 1,10,000 Jan 30, 2021 Salaries paid Rs. 40,000 Jan 30, 2021 Rent paid Rs. 20,000	5	3	4	11
	OR					
5. c)	Explain Double Entry System and its advantages	5	2	4	11
5. d)	Prepare Trading and Profit and Loss account from the following information.	5	3	4	11

Trading and Profit and Loss (5. d))

Trial Balance as on 31.03.2021		
Particulars	**Debit(₹)**	**Credit(₹)**
Capital		1,00,000
Purchases	40,000	
Furniture	30,000	
Interest received		3,000
Cash	15,000	
Debtors	27,000	
Office Stationery	3,000	
Machinery	70,000	
Bank Loan		5,000
Bills Payable		2,000
Opening Stock	10,000	
Sales		90,000
Wages paid	600	
Salaries paid	2,500	
Electricity charges	1,200	
Insurance paid	700	
Total	2,00,000	2,00,000

Adjustments:
i)   Closing Stock ₹ 12,000
ii)   Depreciate Machinery @10% p.a.
iii)   Salaries outstanding ₹ 500

	Unit-V					
6. a)	How accounting ratios are useful in the inter-firm comparison.	5	1	5	10
6. b)	From the given Balance Sheet calculate: a) Debt-equity ratio b) Liquidity ratio c) Fixed assets to current assets ratio and d) Fixed assets to Net worth ratio.	5	3	5	10

Balance Sheet

Liabilities	Rs.	Assets	Rs.
Share Capital	1,00,000	Goodwill	60,000

		Retained Earnings	10,000	Machinery	1,00,000				
		Profit and loss a/c	40,000	Stock	30,000				
		Secured loans	80,000	Debtors	70,000				
		Creditors	40,000	Furniture	10,000				
		Provision for taxation	30,000	Cash	30,000				
			3,00,000		3,00,000				

		OR							
6. c)	Differentiate Liquidity ratios and leverage ratios.					5	4	5	11
6. d)	The Balance Sheet of ABC Limited as on 31-03-2018 was as follows:					5	3	5	11

Liabilities	Amount (₹)	Assets	Amount (₹)
Equity Share Capital	1,40,000	Plant and Machinery	1,24,000
Reserves and Surplus	1,28,000	Land and Buildings	1,30,000
Debentures	1,32,000	Furniture & Fixtures	26,000
Creditors	26,000	Stock	2,000
Bank overdraft	4,000	Debtors	22,000
Provision for Taxation:	6,000	Investments (Short-term)	4,000
Outstanding Expenses	2,000	Cash	12,000
Bills payable	2,000	Cash at Bank	65,000
			55,000
	440,000		440,000

From the above, compute and interpret
a) Current Ratio b) Quick Ratio c) Absolute Liquid Ratio d) Debt-Equity Ratio e) Proprietary Ratio.

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous) | **MR-22**

B.Tech. V Semester End Examinations
(Metallurgical and Materials Engineering)
(Model Question Paper)

Subject Title: Transport Phenomena **Subject Code: MM501PC**
Time: 3 hours Max. Marks : 60

Note: Answer ALL Questions
Part-A (10 x 1 = 10 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
1. a)	What are the different types of transport?	1	2	1	1,2
1. b)	What are the types of flow and the Reynolds number at which they occur	1	1	1	1,2
	Unit-II				
1. c)	Which balance should one do to derive the equation of continuity & motion?	1	2	2	1,2
1. d)	What is friction factor?	1	1	2	1,2
	Unit-III				
1. e)	What is Fourier's law of heat conduction? Explain with the sketch	1	2	3	1,2
1. f)	What is radiation heat transfer?	1	1	3	1,2
	Unit-IV				
1. g)	What is Ficks first law? Explain with the sketch	1	2	4	1,2
1. h)	What is a concentration boundary layer? Use a sketch to explain	1	3	4	1,2
	Unit-V				
1. i)	Derive the fundamental units for viscosity	1	3	5	1,2
1. j)	What is the physical meaning of Prandtl number	1	2	5	1,2

Part-B (5 x 10=50 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
2. a)	Derive Newtons law of viscosity. Use a sketch to explain	5	3	1	1,2
2. b)	Explain Reynolds experiments with sketch	5	2	1	1,2
	OR				
2. c)	Discuss molecular theory of viscosity of gas/liquid	5	2	1	1,2
2. d)	Compare the fundamental equations of momentum, heat and mass transfer and explain the similarity between them	5	3	1	1,2
	Unit-II				
3. a)	Derive the equation of continuity	5	1	2	1,2
3. b)	State the Navier-Stokes equation. List the variables in it and give their SI units	5	2	2	1,2
	OR				
3. c)	State Darcy's law. Draw the schematic and give the SI units of all the variables. Which equation, derived for laminar flow in pipes, is it similar to?	5	2	2	1,2
3. d)	What is the Reynolds number below which Stokes equation is valid? What happens if the buoyancy force is greater than the gravitational force?	5	3	2	1,2
	Unit-III				
4. a)	Show that under certain conditions heat balance equation reduces to Laplace equation	5	1	3	1,2
4. b)	What is Biot number? Calculate Biot number if h is 20 kW/m^2°K, characteristic length is 50 m and thermal conductivity is 5 kW/m°K	5	1	3	1,2
	OR				
4. c)	Draw the temperature profile for Biot no ~1, ∞ and <<1. Explain	5	1	3	1,2

		M	L	CO	PO
	the nature of the profile for each Biot number				
4. d)	Derive the heat balance equation	5	2	3	1,2
Unit-IV					
5. a)	State Knudsen's diffusion equation. What is effective diffusivity? draw the schematic and show the lengths to calculate tortuosity	5	2	4	1,2
5. b)	What is convective mass transfer coefficient? Derive an equation for it.	5	2	4	1,2
OR					
5. c)	Using D= $3\times10\text{-}11$ m^2/s and C/Cs=0.5, calculate the time (in hours) required to achieve a diffusion distance of 0.1 cm	5	1	4	1,2
5. d)	A mixture of He & N$_2$ gas is contained in a pipe at 298K & 1atm total pressure. At one end of the pipe the partial pressure of He is 0.6 atm & at the other end is 0.2 atm. Calculate the flux of He at steady state if D$_{AB}$ of the He-N$_2$ mixture is 0.687×10^{-4} m^2/s	5	1	4	1,2
Unit-V					
6. a)	State 3 dimensionless numbers & give their physical meaning	5	1	5	1,2
6. b)	What are similarity criteria? How are they used in building a pilot plant?	5	2	5	1,2
OR					
6. c)	What are the similarities in heat, mass & momentum transfer?	5	2	5	1,2
6. d)	Give 3 instances showing the relations between dimensionless numbers	5	1	5	1,2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous)
B.Tech. V Semester End Examinations
(Metallurgical and Materials Engineering)
(Model Question Paper)

MR-22

Subject Title: Mechanical Working of Metals   **Subject Code: MM502PC**
Time: 3 hours   Max. Marks : 60

Note: Answer ALL Questions
Part-A (10 x 1 = 10 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
1. a)	What is plane stress?	1	1	1	1,2
1. b)	What is the significance of Mohr's circle?	1	2	2	1,2
	Unit-II				
1. c)	What is a flow curve?	1	1	1	1,2
1. d)	State Tresca criterion.	1	2	2	1,2
	Unit-II1				
1. e)	Differentiate between cold working and hot working.	1	3	2	1,2
1. f)	What is flash in forging process?	1	2	3	1,2
	Unit-IV				
1. g)	Define neutral point in rolling process.	1	1	3	1,2
1. h)	What is maximum draft in rolling process.	1	2	4	1,2
	Unit-V				
1. i)	What is impact extrusion? Give some examples.	1	1	4	1,2
1. j)	What is tube sinking?	1	1	5	1,2

Part-B (5 x 10 = 50 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
2. a)	Describe the stress at a point with a neat sketch.	5	1	1	1,2
2. b)	Explain the Mohr's circle of stress in three dimensions with the help of neat diagram	5	2	2	1,2
	OR				
2. c)	Explain hydrostatic and deviatoric components of stress.	5	3	1	1,2
2. d)	What is plain strain?Explain the importance of plain strain conditions in metal working processes.	5	2	1	1,2
	Unit-II				
3. a)	Explain why true strain is an advantage in metal working.	5	2	2	1,2
3. b)	State and explain Von-Mises criteria for yielding of ductile materials	5	2	2	1,2
	OR				
3. c)	Derive the relationship between True stress and engineering stress, True strain and engineering strain.	5	4	2	1,2
3. d)	Explain constancy of volume relationship.	5	2	2	1,2
	Unit-III				
4. a)	Explain the classification of metal working processes.	5	2	3	1,2
4. b)	What is explosive forming? Explain its applications, advantages and disadvantages.	5	1	3	1,2
	OR				
4. c)	Explain recovery, recrystallisation and grain growth.	5	2	3	1,2
4. d)	Discuss deformation zone geometry	5	3	3	1,2
	Unit-IV				
5. a)	With the help of a neat sketch explain the closed die forging process and discuss its advantages and disadvantages	5	3	4	1,2
5. b)	How do you classify rolling processes and rolling mills?	5	2	4	1,2
	OR				

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5. c)	List out various defects in rolled products and their causes.	5	2	4	1,2
5. d)	What is the role of rolling load and rolling variables on rolling processes?	5	2	4	1,2
Unit-V					
6. a)	Explain with sketches the differences between direct and indirect extrusion.	5	4	5	1,2
6. b)	By means of neat sketch explain tube drawing processes.	5	4	5	1,2
OR					
6. c)	Discuss various extrusion defects with the help of neat sketches.	5	3	5	1,2
6. d)	Explain deep drawing of sheets.	5	3	5	1,2

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MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous) | **MR-22**

B.Tech. V Semester End Examinations
(Metallurgical and Materials Engineering)
(Model Question Paper)

Subject Title: Metal Casting   Subject Code: MM503PC

Time: 3 hours   Max. Marks : 60

Note: Answer ALL Questions
Part-A (10 x 1 = 10 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
Unit-I					
1. a)	Define Core and write functions of core	1	2	1	1,2
1. b)	Which casting process is called as Lost wax process and why the name has come	1	1	1	1,2
Unit-II					
1. c)	Whether Iron alloy castings can be manufactured through Die casting technique and justify your answer	1	2	2	1,2
1. d)	What are the parameters to be considered to get a good casting by centrifugal casting process	1	1	2	1,2
Unit-III					
1. e)	Draw the cooling curve for pure metal, eutectic and alloys	1	2	3	1,2
1. f)	What are the components of gating system explain with heat sketch	1	1	3	1,2
Unit-IV					
1. g)	What is the need for new casting techniques and explain your answer	1	2	4	1,2
1. h)	Write about the importance of Induction furnace Melting	1	3	4	1,2
Unit-V					
1. i)	What type of casting defect is caused by Hydrogen in molten metal	1	3	5	1,2
1. j)	List out the casting defects due to improper moulding	1	2	5	1,2

Part-B (5 x 10=50 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
Unit-I					
2. a)	Mention five differences between traditional and new casting manufacturing techniques	5	3	1	1,2
2. b)	How shell moulding process is carried out and write from making of shells to obtain casting with relevant drawings	5	2	1	1,2
OR					
2. c)	Discuss on the following with respect to Investment casting with the help of neat sketches: (a) Selection of pattern material (b) Removal of patterns (c) Coating of patterns (d) Advantages and limitations of the process	5	2	1	1,2
2. d)	Write CO2 process of moulding from raw materials to making of casting.	5	3	1	1,2
Unit-II					
3. a)	Write about centrifugal casting with relevant drawings	5	1	2	1,2
3. b)	Mention five differences between permanent and expendable casting techniques	5	2	2	1,2
OR					
3. c)	Describe in details with the help of neat diagrams the different pressure die casting processes	5	2	2	1,2
3. d)	Describe about the squeeze and composite castings	5	3	2	1,2
Unit-III					
4. a)	With neat sketches explain the differences between columnar growth and dendritic growth during solidification of castings?	5	1	3	1,2
4. b)	Discuss about the directional solidification. How is it achieved in	5	1	3	1,2

	practice and Discuss?				
OR					
4. c)	Distinguish between pressurized and non-pressurized gating system used in foundry Explain with 'suitable examples and neat sketches.	5	1	3	1,2
4. d)	What is progressive solidification? How is it achieved? Explain. Discuss the advantage and disadvantages of directional and progressive solidifications?	5	2	3	1,2
Unit-IV					
5. a)	Write notes on cold setting and self setting process Furan resins	5	2	4	1,2
5. b)	Compare and distinguish between bake and no bake sand moulds	5	2	4	1,2
OR					
5. c)	Draw cupola furnace, label it and write chemical reactions	5	1	4	1,2
5. d)	Explain about Induction furnace with a suitable sketch	5	1	4	1,2
Unit-V					
6. a)	Discuss the formation of shrinkage and porosity defects in castings	5	1	5	1,2
6. b)	What are the various casting defects that form due to incomplete / improper feeding? Explain them with suitable figures and suggest suitable remedial measures.	5	2	5	1,2
OR					
6. c)	What are various types of metallurgical defects? What are the causes and remedies for such defects? Explain with neat diagrams.	5	2	5	1,2
6. d)	Write short notes on the importance of NDT in metal casting industry	5	1	5	1,2

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MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous)
B.Tech. V Semester End Examinations
(Metallurgical and Materials Engineering)
(Model Question Paper)

MR-22

Subject Title: Nonferrous Extractive Metallurgy   **Subject Code: MM504PC**
Time: 3 hours   Max. Marks: 60

Note: Answer ALL Questions
Part-A (10 x 1 = 10 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
1. a)	Why is Chalcopyrite designated as the principal ore mineral of copper?	1	2	1	2
1. b)	Define electrowinning.	1	1	1	1
	Unit-II				
1. c)	What is cupellation?	1	1	2	1
1. d)	Mention the applications of zinc.	1	2	2	3
	Unit-III				
1. e)	Define anode effect.	1	1	3	1
1. f)	Mention few alternate processes of aluminium extraction.	1	1	3	2
	Unit-IV				
1. g)	List out the significant characteristics of titanium.	1	3	4	3
1. h)	What are the critical applications of magnesium?	1	1	4	1
	Unit-V				
1. i)	Outline few ore minerals of Uranium.	1	5	5	2
1. j)	What are applications of tungsten?	1	1	5	1

Part-B (5 x 10=50 Marks)

Q. No.	Stem of the Question	M	L	CO	PO
	Unit-I				
2. a)	Discuss the continuous copper extraction methods in detail.	5	2	1	3
2. b)	Explain the refining of blister copper.	5	4	1	3
	OR				
2. c)	Explain the steps involved in pyrometallurgical extraction of copper.	5	2	2	3
2. d)	Discuss the hydrometallurgical extraction of copper in detail.	5	4	2	3
	Unit-II				
3. a)	Distinguish horizontal retort and vertical retort processes of zinc extraction.	5	3	1	3
3. b)	Write notes on refining of lead bullion.	5	2	2	2
	OR				
3. c)	Outlining a neat schematic, explain the pyrometallurgical extraction of zinc.	5	3	3	3
3. d)	Explain the steps involved in extraction of lead through pyrometallurgy.	5	1	2	2
	Unit-III				
4. a)	Discuss Bayer's process in detail.	5	1	2	3
4. b)	Analyze "anode effect" citing appropriate examples.	5	3	2	4
	OR				
4. c)	Outline a neat schematic, explain the Hall-Heraoult Process in detail.	5	3	3	3
4. d)	Analyze the factors that influence the efficiency of Hall-Heraoult Process.	5	3	2	4

	Unit-IV				
5. a)	Distinguish Dow process and Hansgrieg process of magnesium extraction.	5	2	4	3
5. b)	Illustrate the flow sheet for the extraction of magnesium through Dow process.	5	2	4	4
	OR				
5. c)	Outline a neat flow sheet and explain the upgrading of ileminite in detail.	5	5	4	3
5. d)	Explain Kroll's process of extraction of titanium in detail.	5	1	5	2
	Unit-V				
6. a)	Compare the acid and alkali leaching of uranium ores.	5	4	5	3
6. b)	Outline the flow sheet for extraction of nickel.	5	3	5	3
	OR				
6. c)	Analyze the status of nonferrous metal industries in India.	5	5	4	4
6. d)	Explain the production of reactor grade UO_2 in detail.	5	1	4	2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome