Code: 4G553

R-14

III B.Tech. I Semester Supplementary Examinations November 2019

Machine Tools

(Mechanical Engineering)

Max. Marks: 70
Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Describe about mechanics of chip formation? 7M

   b) Write about functions of cutting fluid and thermal aspects? 7M

OR

2. a) Explain about the types of chips. 7M

   b) Write about tool wear and tool life? 7M

UNIT–II

3. Describe about the constructional features and specifications of centre lathe with neat diagram? 14M

OR

4. a) Explain machining time calculations and power estimation of lathe. 7M

   b) Write about automatic screw type – multi spindle with neat diagram? 7M

UNIT–III

5. a) Distinguish between shaper and planer? 7M

   b) Describe about principle of operation of drilling machine with neat sketch? 7M

OR

6. a) Describe about fine boring machine with neat sketch? 7M

   b) State and explain accessories to milling machines. 7M

UNIT–IV

7. Explain different types of grinding process in detail. 14M

OR

8. a) Write the concepts of surface integrity? 5M

   b) Describe about the types of broaching machines? 9M

UNIT–V

9. a) Comparison of lapping and honing machines? 7M

   b) Classify jigs in detail? 7M

OR

10. a) Explain the constructional features of grinding machine. 7M

    b) Write about the work holding devices? 7M

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R-14

Code: 4GA51

III B.Tech. I Semester Supplementary Examinations November 2019

Managerial Economics and Financial Analysis

(Common to CE, ME & ECE)

Max. Marks: 70   Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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| UNIT–I |

1. What do you mean by Managerial Economics? Describe the Nature and Scope of Managerial Economics?

OR

2. Discuss about the time perspective in business decision? Under what kind of business decisions time perspectives become an important consideration?

| UNIT–II |

3. What is meant by Elasticity of Demand? How is the Elasticity of Demand measured?

OR

4. Discuss about the cost – output relationship in the short run and the long run?

| UNIT–III |

5. "Monopolistic competition is the middle ground between perfect completion and monopoly" explain the statement in detail.

OR

6. Briefly explain the features, merits and demerits of public and private sector business organizations?

| UNIT–IV |

7. A company has **two** investment proposals each costing Rs.1,00,000 and the expected cash inflows are given below;

Year	1	2	3	4	5
Project – A	20,000	30,000	50,000	50,000	20,000
Project – B	35,000	35,000	35,000	35,000	35,000

The cost of capital is 10%. Calculate NPV and Profitability Index. Suggest the management.

OR

8. Define Accounting. Explain Double Entry Book Keeping System. Explain the classification of Accounts with detail examples?

| UNIT–V |

9. Elucidate the Solvency and Profitability Ratios?

OR

10. The following figures are extracted from the Balance Sheet of X Ltd., as on 31st December.

Particulars	2017 (Rs.)	2018 (Rs.)	Particulars	2017 (Rs.)	2018 (Rs.)
Stock	25,000	40,000	Bills Payable	2,000	3,000
Debtors	10,000	16,000	Provision for taxes	5,000	7,000
Cash at Bank	5,000	4,000	Bank Overdraft	5,000	15,000
Creditors	8,000	15,000			

Calculate the Current Ratio and Acid Test Ratio for the two years and comment on the Liquidity position of the company.

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R-14

Code: 4G555

III B.Tech. I Semester Supplementary Examinations November 2019
Heat Transfer
(Mechanical Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) List out the modes of Heat transfer and define them.   6M

    b) Asbestos layer of 5mm thickness (k=0.115W/mK) is used as insulation material over a boiler wall. Consider an area of $1.0 m^2$ and find out the rate of heat flow as well as the heat flux over this area if the temperatures on either side of the insulation are 400^0C and 40^0C.   8M

OR

2. a) Derive the three-dimensional general heat conduction equation in Cartesian Coordinate. Deduce the Laplace equation from it.   10M

    b) What is thermal diffusivity? Explain its importance in heat conduction.   4M

UNIT–II

3. a) The temperature at the inner and outer surfaces of a boiler wall made of 20 mm thick steel and covered with an insulating material of 5 mm thickness are 300^0C and 50^0C respectively. If the thermal conductivities of steel and insulating material are $58W/m^0C$ and $0.116 W/m^0C$ respectively, determine the rate of flow through the boiler wall.   8M

    b) What is a composite plane wall? Derive expression for temperature distribution and heat flow in a composite plane wall situation.   6M

OR

4. a) A cold storage room has walls made of 23 cm of brick on the outside, 8 cm of plastic foam and finally 1.5 cm of wood on the inside. The outside and inside air temperatures are 22°C and -2°C respectively. The inside and outside heat transfer coefficients are respectively 29 and 12 W/m^2K. The thermal conductivities of brick, foam and wood are 0.98, 0.02 and 0.12 W/m.K respectively. If the total wall area is 90 m^2, determine the rate of heat removal by refrigeration and the temperature of the inside surface of the brick.   8M

    b) Define Biot number and Fourier number. What is its significance?   6M

UNIT–III

5. a) Describe Buckingham's method of   -terms to formulate a dimensionally homogenous equation.   8M

    b) List out the dimensionless numbers used in free convection situation and their mathematical expressions.   6M

OR

6. a) A vertical pipe 80 mm diameter and 2 m height is maintained at a constant temperature of 120°C. The pipe is surrounded by still atmospheric air at 30°C . Find heat loss by natural convection.   8M

    b) Discuss about the development of Hydrodynamic and thermal boundary layer along a vertical plate in a free convection situation.   6M

UNIT–IV

7. a) Show that the emissive power of a black body is ‑times the intensity of emitted radiation

8M

b) Differentiate between Film wise and Drop wise Condensation. Why the heat transfer coefficients are larger in film wise than drop wise condensation?

6M

OR

8. a) Write a short notes on (i) Radiation shape factor (ii) Radiation shields

6M

b) Describe in detail the process of pool boiling curve with a neat sketch.

8M

UNIT–V

9. a) Discuss briefly on Fouling factor.

6M

b) Derive the expression for LMTD of a Counter flow heat exchanger.

8M

OR

10. a) Saturated steam at 120^0C is condensing on the outer tube surface of a single pass heat exchanger. The overall heat transfer coefficient is U0 = 1800 W/m^{2}K. Determine the surface area of a heat exchanger capable of heating 1000 kg/h of water from 20^0C to 90^0C. Also compute the rate of condensation of steam hfg=2200kJ/kg.

7M

b) Consider a heat exchanger for cooling oil which enters at 180^0C, and cooling water enters at 25^0C. Mass flow rates of oil and water are: 2.5 kg/s and 1.2 kg/s, respectively. Area for heat transfer =16m^2. Specific heat data for oil and water and overall heat transfer coefficient are given: Cpoil=1900J/kgK; Cp water=4184J/kgK; U=285 W/m^{2}K. Calculate outlet temperatures of oil and water for parallel flow heat exchanger

7M

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