

## II B.Tech. I Semester MODEL QUESTION PAPER

## NUMERICAL METHODS AND TRANSFORM TECHNIQUES

For ME

Time: 3 Hrs.

Max. Mars: 70 M

Answer Question No.1 compulsorily

Answer **ONE Question** from **EACH UNIT**

Assume suitable data if necessary

10 x 2 = 20 Marks

|    |     |  | CO | KL | M |
|----|-----|--|----|----|---|
| 1. | (a) | Find the interval of the root of the equation $x^3 - 4x - 9 = 0$                                 | 1  | 3  | 2 |
|    | (b) | Write Lagrange's interpolation formula.  | 1  | 1  | 2 |
|    | (c) | State the Simpson's 1/3 <sup>rd</sup> Rule formula.  | 2  | 1  | 2 |
|    | (d) | Using Euler's formula, find $y(0.1)$ given that $\frac{dy}{dx} = x + 2y^2$ ,<br>$y(0) = 1$       | 2  | 3  | 2 |
|    | (e) | Find $L\left(\frac{\sin t}{t}\right)$  | 3  | 3  | 2 |
|    | (f) | State the convolution theorem of Laplace transforms.   | 3  | 1  | 2 |
|    | (g) | If $f(x) = x^4$ in $(-1,1)$ , Find the Fourier coefficient $b_n$ .                               | 4  | 3  | 2 |
|    | (h) | What is the formula for finding the half range cosine series of the function $f(x)$ in $(0,l)$ . | 4  | 1  | 2 |
|    | (i) | State any two properties of Fourier Transforms.  | 5  | 1  | 2 |
|    | (j) | What is Fourier integral representation of a function.   | 5  | 1  | 2 |

5 x 10 = 50 Marks

## UNIT-1

|     |     |   |     |     |     |   |   |    |     |   |    |    |     |     |   |   |   |
|-----|-----|---|-----|-----|-----|---|---|----|-----|---|----|----|-----|-----|---|---|---|
| 2.  | (a) | Find a real root of the equation $x^3 - x - 4 = 0$ by bisection method.   | CO  | 3   | 5   |   |   |    |     |   |    |    |     |     |   |   |   |
|     | (b) | Using Newton Raphson method, find a real root of the equation<br>$3x = \cos x + 1$  | 1   | 3   | 5   |   |   |    |     |   |    |    |     |     |   |   |   |
|     |     | <b>OR</b>   |     |     |     |   |   |    |     |   |    |    |     |     |   |   |   |
| 3.  | (a) | Use appropriate interpolation formula to find $f(10)$ from the following.<br><table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td><math>x</math></td> <td>0</td> <td>2</td> <td>4</td> <td>6</td> <td>8</td> </tr> <tr> <td><math>y</math></td> <td>7</td> <td>13</td> <td>43</td> <td>145</td> <td>367</td> </tr> </table> | $x$ | 0   | 2   | 4 | 6 | 8  | $y$ | 7 | 13 | 43 | 145 | 367 | 1 | 3 | 5 |
| $x$ | 0   | 2   | 4   | 6   | 8   |   |   |    |     |   |    |    |     |     |   |   |   |
| $y$ | 7   | 13  | 43  | 145 | 367 |   |   |    |     |   |    |    |     |     |   |   |   |
|     | (b) | Using Lagrange's method, find $y(6)$ given that<br><table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td><math>x</math></td> <td>3</td> <td>5</td> <td>7</td> <td>9</td> <td>11</td> </tr> <tr> <td><math>y</math></td> <td>6</td> <td>24</td> <td>58</td> <td>108</td> <td>74</td> </tr> </table>                           | $x$ | 3   | 5   | 7 | 9 | 11 | $y$ | 6 | 24 | 58 | 108 | 74  | 1 | 3 | 5 |
| $x$ | 3   | 5   | 7   | 9   | 11  |   |   |    |     |   |    |    |     |     |   |   |   |
| $y$ | 6   | 24  | 58  | 108 | 74  |   |   |    |     |   |    |    |     |     |   |   |   |

| UNIT-2        |     |  |   |   |    |
|---------------|-----|--|---|---|----|
| 4.            | (a) | Evaluate $\int_0^1 \sqrt{1+x^3} dx$ taking $h = 0.1$ , using Trapezoidal Rule.   | 2 | 3 | 5  |
|               | (b) | Using Simpson's 3/8 <sup>th</sup> rule, evaluate $\int_0^6 \frac{dx}{1+x^2}$ by dividing the range into 6 equal parts.               | 2 | 3 | 5  |
| <b>OR</b>     |     |  |   |   |    |
| 5             |     | Using Runge-Kutta method, find $y(0.2)$ for the equation $\frac{dy}{dx} = \frac{y-x}{y+x}$ , $y(0) = 1$ taking $h = 0.1$             | 2 | 3 | 10 |
| <b>UNIT-3</b> |     |  |   |   |    |
| 6.            | (a) | Find $L\{e^{-3t}(2\cos 5t - 3\sin 5t)\}$   | 3 | 3 | 5  |
|               | (b) | Using Convolution theorem, find $L^{-1}\left\{\frac{s}{(s^2+a^2)^2}\right\}$   | 3 | 3 | 5  |
| <b>OR</b>     |     |  |   |   |    |
| 7.            |     | Using Laplace transform, solve $y'' + 2y' - 3y = \sin t$ , given that $y(0) = y'(0) = 0$ .   | 3 | 3 | 10 |
| <b>UNIT-4</b> |     |  |   |   |    |
| 8.            | (a) | Determine the Fourier series for $f(x) = \pi x$ in $0 \leq x \leq 2$   | 4 | 3 | 5  |
|               | (b) | Expand $f(x) = e^{-x}$ as a Fourier series in $(-1,1)$   | 4 | 3 | 5  |
| <b>OR</b>     |     |  |   |   |    |
| 9.            | (a) | Find the Fourier series of the function $f(x) = x$ in $[0, 2\pi]$  | 4 | 3 | 5  |
|               | (b) | Find the half range sine series for the function $f(x) = x - x^2$ in $0 < x < \pi$   | 4 | 3 | 5  |
| <b>UNIT-5</b> |     |  |   |   |    |
| 10.           | (a) | Using Fourier integral, prove that $\int_0^\infty \frac{\cos \lambda x}{1+\lambda^2} d\lambda = \frac{\pi}{2} e^{-x}$ , $(x \geq 0)$ | 5 | 3 | 5  |
|               | (b) | Find the Fourier cosine transform of $e^{-ax}$ .   | 5 | 3 | 5  |
| <b>OR</b>     |     |  |   |   |    |
| 11.           | (a) | Solve the integral equation $\int_0^\infty f(x) \cos sx dx = e^{-s}$   | 5 | 3 | 5  |
|               | (b) | Find the Finite Fourier sine transform of $f(x) = 2x$ , $0 < x < 4$  | 5 | 3 | 5  |

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE: Questions can be given as A,B splits or as a single Question for 10 marks

|  |     |   |                         |           |            |
|--|-----|---|-------------------------|-----------|------------|
| <b>Course Code: B23HS2101</b>  |     |   |                         |           |            |
| <b>SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)</b>                           |     |   |                         |           | <b>R23</b> |
| <b>II B.Tech. I Semester MODEL QUESTION PAPER</b>                                |     |   |                         |           |            |
| <b>UNIVERSAL HUMAN VALUES-2: UNDERSTANDING HARMONY AND ETHICAL HUMAN CONDUCT</b> |     |   |                         |           |            |
| <b>(Common to all programmes of Engineering)</b>                                 |     |   |                         |           |            |
| <b>Time: 3 Hrs.</b>  |     |   | <b>Max. Marks: 70 M</b> |           |            |
| Answer Question No.1 compulsorily  |     |   |                         |           |            |
| Answer <b>ONE Question</b> from <b>EACH UNIT</b>                                 |     |   |                         |           |            |
| Assume suitable data if necessary  |     |   |                         |           |            |
| <b>10 x 2 = 20 Marks</b>   |     |   |                         |           |            |
|  |     |   | <b>CO</b>               | <b>KL</b> | <b>M</b>   |
| 1.   | a). | What are the basic guidelines for value education?                                | 1                       | 2         | 2          |
|  | b). | What is MBTI personality test?  | 1                       | 2         | 2          |
|  | c). | How can we differentiate between the needs of the Self and the needs of the Body? | 2                       | 2         | 2          |
|  | d). | What are the characteristics and activities of the Self (I)?                      | 2                       | 2         | 2          |
|  | e). | How is 'respect' defined in the context of human interaction?                     | 3                       | 2         | 2          |
|  | f). | How is society described in relation to the family?                               | 3                       | 2         | 2          |
|  | g). | How are the four orders of nature interconnected?                                 | 4                       | 2         | 2          |
|  | h). | How does the idea of self-regulation in nature contribute to its harmony?         | 4                       | 2         | 2          |
|  | i). | Define definitiveness of (ethical) human conduct.                                 | 5                       | 2         | 2          |
|  | j). | Explain how humanistic education can influence professional ethics.               | 5                       | 2         | 2          |
| <b>5 x 10 = 50 Marks</b>   |     |   |                         |           |            |
| <b>UNIT - I</b>  |     |   |                         |           |            |
| 2.   | a). | Discuss natural acceptance  | 1                       | 2         | 5          |
|  | b). | Differentiate prosperity and deprivation  | 1                       | 2         | 5          |
| <b>OR</b>  |     |   |                         |           |            |
| 3.   | a). | Deliberate the right understanding in perspective to self exploration.            | 1                       | 2         | 5          |
|  | b). | What are the key functions of the MBTI? Explain.                                  | 1                       | 2         | 5          |
| <b>UNIT - II</b>   |     |   |                         |           |            |
| 4.   | a). | Illustrate coexistence of "I" and "Body".   | 1                       | 2         | 5          |
|  | b). | Distinguishing between the Needs of the Self and the Body                         | 1                       | 2         | 5          |
| <b>OR</b>  |     |   |                         |           |            |
| 5.   | a). | Discuss Characteristic activities of Harmony with "I".                            | 1                       | 2         | 5          |
|  | b). | Explain Sanyam and Health.  | 1                       | 2         | 5          |

| <b>UNIT - III</b> |            |  |          |          |           |
|-------------------|------------|--|----------|----------|-----------|
| <b>6.</b>         | <b>a).</b> | Write a note on human-human relationship as regarding harmony.                           | <b>2</b> | <b>2</b> | <b>5</b>  |
|                   | <b>b).</b> | Differentiate intention and competence.  | <b>2</b> | <b>2</b> | <b>5</b>  |
| <b>OR</b>         |            |  |          |          |           |
| <b>7.</b>         | <b>a).</b> | Discuss salient values in relationship.  | <b>3</b> | <b>2</b> | <b>5</b>  |
|                   | <b>b).</b> | Illustrate universal Harmonious Society - an Undivided society.                          | <b>3</b> | <b>2</b> | <b>5</b>  |
| <b>UNIT - IV</b>  |            |  |          |          |           |
| <b>8.</b>         |            | Discuss orders of life in nature and its significance self regulation of individual      | <b>4</b> | <b>2</b> | <b>10</b> |
| <b>OR</b>         |            |  |          |          |           |
| <b>9.</b>         |            | Illustrate existence of human being as coexistence with universe in perspective of space | <b>4</b> | <b>2</b> | <b>10</b> |
| <b>UNIT - V</b>   |            |  |          |          |           |
| <b>10.</b>        |            | Discuss importance of professional competence for augmenting universal human order.      | <b>5</b> | <b>2</b> | <b>10</b> |
| <b>OR</b>         |            |  |          |          |           |
| <b>11.</b>        | <b>a).</b> | Case study of typical holistic technologies.   | <b>5</b> | <b>2</b> | <b>5</b>  |
|                   | <b>b).</b> | Role of engineer in promoting harmony in society   | <b>5</b> | <b>2</b> | <b>5</b>  |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 10 marks

Course Code: B23ME2101

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

R23

II B.Tech. I Semester MODEL QUESTION PAPER

THERMODYNAMICS

For ME

Time: 3 Hrs.

Max. Marks: 70 M

Answer Question No.1 compulsorily

Answer **ONE** Question from **EACH** UNIT

Assume suitable data if necessary

10 x 2 = 20 Marks

|    |     |   | CO | KL | M |
|----|-----|---|----|----|---|
| 1. | a). | State the Quasi static Process                | 1  | 1  | 2 |
|    | b). | Describe the heat and work                    | 1  | 2  | 2 |
|    | c). | State the first law of thermodynamics         | 2  | 1  | 2 |
|    | d). | Define Internal Energy                        | 2  | 1  | 2 |
|    | e). | Give the Clausius statement of the second law | 3  | 1  | 2 |
|    | f). | Define the entropy                            | 3  | 1  | 2 |
|    | g). | State the mean effective pressure             | 4  | 1  | 2 |
|    | h). | Describe the S.I Engine                       | 4  | 2  | 2 |
|    | i). | State the COP of refrigerator                 | 5  | 1  | 2 |
|    | j). | Define the SHF                                | 5  | 1  | 2 |

5 x 10 = 50 Marks

| UNIT-1 |  |   |   |   |    |
|--------|--|---|---|---|----|
| 2.     |  | What do you mean by thermodynamic System? Discuss different types of systems with one example each  | 1 | 2 | 10 |
|        |  | <b>OR</b>   |   |   |    |
| 3.     |  | Show the equation of state for a perfect gas and discuss the universal gas constant   | 1 | 2 | 10 |
| UNIT-2 |  |   |   |   |    |
| 4.     |  | Infer the expression for specific heat at constant Volume.  | 2 | 3 | 10 |
|        |  | <b>OR</b>   |   |   |    |
| 5.     |  | A turbine operates under study flow condition receives steam at the following state: pressure= 1.2 Mpa, Temperature =188 <sup>0</sup> C, Enthalpy= 2785 KJ/Kg, Velocity =33.3 m/sec and elevation=3m. The steam leaves the turbine at the following state: pressure= 20Kpa, Enthalpy= 2512 KJ/Kg, Velocity =100 m/sec and elevation=0m.Heat is lost to the surrounding at the rate of 0.29KJ/sec. If the rate steam flow to the | 2 | 3 | 10 |

|            |   |          |          |           |
|------------|---|----------|----------|-----------|
|            | turbine is 0.42 Kg/sec Determine the power output of the turbine in KW  |          |          |           |
|            |   |          |          |           |
|            | <b>UNIT-3</b>   |          |          |           |
| <b>6.</b>  | Explain the operation of the refrigerator with a block diagram and Calculate the power required by a 40 ton fish freezing plant having a freezing temperature $-35^{\circ}\text{C}$ and ambient temperature $30^{\circ}\text{C}$ . The performance of the plant is 20% of the theoretical reversed Carnot cycle working within the same temperature limits. | <b>3</b> | <b>3</b> | <b>10</b> |
|            | <b>OR</b>   |          |          |           |
| <b>7.</b>  | Establish the inequality of Clausius and discuss the principle of entropy with an example.  | <b>3</b> | <b>3</b> | <b>10</b> |
|            |   |          |          |           |
|            | <b>UNIT-4</b>   |          |          |           |
| <b>8.</b>  | Derive the thermal efficiency of diesel cycle with help of the P-V and T-S diagram  | <b>4</b> | <b>3</b> | <b>10</b> |
|            | <b>OR</b>   |          |          |           |
| <b>9.</b>  | Differentiate between two stroke and four stroke engines.   | <b>4</b> | <b>2</b> | <b>10</b> |
|            |   |          |          |           |
|            | <b>UNIT-5</b>   |          |          |           |
| <b>10.</b> | Explain the working of vapour compression system with neat sketch   | <b>5</b> | <b>2</b> | <b>10</b> |
|            |   |          |          |           |
|            | <b>OR</b>   |          |          |           |
| <b>11.</b> | Discuss the following psychrometric properties: (i) Dry-bulb temperature. (ii) Wet-bulb temperature. (iii) Relative Humidity  | <b>5</b> | <b>2</b> | <b>10</b> |
|            |   |          |          |           |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 10 marks

| Course Code: B23ME2102                           |     |   |                  |    |     |
|--|-----|---|------------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)  |     |   |                  |    | R23 |
| II B.Tech. I Semester MODEL QUESTION PAPER       |     |   |                  |    |     |
| MECHANICS OF SOLIDS                              |     |   |                  |    |     |
| For ME   |     |   |                  |    |     |
| Time: 3 Hrs.                                     |     |   | Max. Marks: 70 M |    |     |
| Answer Question No.1 compulsorily                |     |   |                  |    |     |
| Answer <b>ONE Question</b> from <b>EACH UNIT</b> |     |   |                  |    |     |
| Assume suitable data if necessary                |     |   |                  |    |     |
| 10 x 2 = 20 Marks                                |     |   |                  |    |     |
|  |     |   | CO               | KL | M   |
| 1.   | a). | Define Poisson's ratio and Young's Modulus.   | 1                | 1  | 2   |
|  | b). | Define principal stress and principal planes.   | 1                | 1  | 2   |
|  | c). | What are the types of supports used to support beams?   | 2                | 1  | 2   |
|  | d). | Define Bending Moment and shear force.  | 2                | 1  | 2   |
|  | e). | What are the assumptions made in theory of simple bending?  | 3                | 1  | 2   |
|  | f). | Define neutral axis and simple bending.   | 3                | 1  | 2   |
|  | g). | Write the expression for the slope at supports and deflection at centre for a simply supported beam with UDL $w$ N per unit length.   | 4                | 1  | 2   |
|  | h). | Define Modulus of rigidity.   | 4                | 1  | 2   |
|  | i). | Name the stresses induced in thin cylinder subjected to internal pressure.  | 5                | 1  | 2   |
|  | j). | State Limitation of Euler's formula.  | 5                | 1  | 2   |
| 5 x 10 = 50 Marks                                |     |   |                  |    |     |
| UNIT-1   |     |   |                  |    |     |
| 2.   |     | A mild steel bar 25 mm diameter and 250 mm long is placed inside a brass tube, having an external diameter of 30 mm and internal diameter of 25 mm. The combination is then subjected to an axial load of 45 kN. Find (a) the stresses in the tube and the rod, (b) the shortening of rod. Take $E_s = 210$ GPa, and $E = 80$ GPa.  | 1                | 3  | 10  |
| OR   |     |   |                  |    |     |
| 3.   |     | A point in a strained material is subjected to a tensile stress of 100 N/mm <sup>2</sup> and a compressive stress of 80 N/mm <sup>2</sup> acting on two mutually perpendicular planes and a shear stress of 20 N/mm <sup>2</sup> acts along these planes. Determine the (i) resultant stress on a plane inclined at 40° with the plane of compressive stress. (ii) principal stresses and planes. | 1                | 3  | 10  |
| UNIT-2   |     |   |                  |    |     |
| 4.   |     | A beam 8.5 m long rests on supports 5 m apart. The beam carries a   | 2                | 3  | 10  |

|     |  |   |   |    |
|-----|--|---|---|----|
|     | UDL of 50 kN/m length between the supports. The beam also carries a point load of 60 kN at the mid span. Construct the SFD and BMD.  |   |   |    |
|     | <b>OR</b>  |   |   |    |
| 5.  | A beam of 10m length is simply supported at its ends. It carries a UDL of 20 kN/m run over the length of left half of its span, together with concentrated loads of 40 kN and 20 kN situated at 1.5 m and 2.5 m respectively from right hand support. Draw SFD and BMD.  | 2 | 3 | 10 |
|     | <b>UNIT-3</b>  |   |   |    |
| 6.  | Stating the assumptions of pure bending and derive the Flexure formula<br>$\frac{M}{I} = \frac{\sigma}{y} = \frac{E}{R}$   | 3 | 3 | 10 |
|     | <b>OR</b>  |   |   |    |
| 7.  | A 7.5 cm x 5 cm rolled steel joist is freely supported over an effective span of 3 metres. The flanges are 0.5 mm thick while the web is 3.7 mm thick. Calculate the UDL the joist can carry if the maximum intensity of shear stress induced is limited to 40 N/mm <sup>2</sup> .   | 3 | 3 | 10 |
|     | <b>UNIT-4</b>  |   |   |    |
| 8.  | A simply supported steel beam 6m long is circular in cross-section and is of 15 cm diameter. What point load should be placed at the mid span to resist the deflection to 1.035 cm? Take E = 2 X 10 <sup>5</sup> N/mm <sup>2</sup> . What will be the slope at the ends?   | 4 | 3 | 10 |
|     | <b>OR</b>  |   |   |    |
| 9.  | A solid circular shaft has to transmit 120 kW at 120 rpm. The maximum torque is 25% greater than the mean torque. Find the diameter of the shaft required if the maximum shear stress is not to exceed 80 N/mm <sup>2</sup> and the angle of twist is not to exceed 1° in a length of 250 cm. Take G = 8 X 10 <sup>4</sup> N/mm <sup>2</sup> .   | 4 | 3 | 10 |
|     | <b>UNIT-5</b>  |   |   |    |
| 10. | Calculate the increase in volume enclosed by a boiler shell, 2.5 m long and 1m in diameter, when it is subjected to an internal pressure of 1.5 N/mm <sup>2</sup> . The wall thickness is such that the maximum tensile stress in the shell is 25 N/mm <sup>2</sup> under the pressure. E = 2.1 X 10 <sup>5</sup> N/mm <sup>2</sup> and μ = 0.3. | 5 | 3 | 10 |
|     | <b>OR</b>  |   |   |    |
| 11. | Derive Euler's buckling load formula for a column having both ends fixed.  | 5 | 3 | 10 |

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE: Questions can be given as A,B splits or as a single Question for 10 marks



Course Code: B23ME2103

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

R23

II B.Tech. I Semester MODEL QUESTION PAPER

MATERIAL SCIENCE AND METALLURGY

For ME

Time: 3 Hrs.

Max. Marks: 70 M

Answer Question No.1 compulsorily

Answer **ONE** Question from **EACH** UNIT

Assume suitable data if necessary

10 x 2 = 20 Marks

|    |     |   | CO | KL | M |
|----|-----|---|----|----|---|
| 1. | a). | Define Space Lattice.   | 1  | 1  | 2 |
|    | b). | What are coordination number of BCC, FCC and HCP crystal structure? | 1  | 2  | 2 |
|    | c). | Briefly discuss about Lever rule.                                   | 2  | 2  | 2 |
|    | d). | Define isomorphous system with example.                             | 2  | 1  | 2 |
|    | e). | Explain about nitriding process.                                    | 3  | 2  | 2 |
|    | f). | What do you mean by hardenability.                                  | 3  | 1  | 2 |
|    | g). | What are the different classifications of steels.                   | 4  | 2  | 2 |
|    | h). | Explain about shape memory alloys.                                  | 4  | 2  | 2 |
|    | i). | Write short note about Fiber reinforced composites.                 | 5  | 1  | 2 |
|    | j). | What are the different methods of producing metal powders           | 5  | 2  | 2 |

5 x 10 = 50 Marks

| UNIT-1        |  |   |   |   |    |
|---------------|--|---|---|---|----|
| 2.            |  | Discuss various types of Point and Line defects in crystals with neat sketches?                           | 1 | 3 | 10 |
| <b>OR</b>     |  |   |   |   |    |
| 3.            |  | Calculate the packing factor and coordination number of F.C.C. unit cell with neat sketches?              | 1 | 3 | 10 |
| <b>UNIT-2</b> |  |   |   |   |    |
| 4.            |  | Describe and distinguish normalizing process and annealing process.                                       | 2 | 2 | 10 |
| <b>OR</b>     |  |   |   |   |    |
| 5.            |  | With the help of a neat sketch explain Fe-Fe <sub>3</sub> C equilibrium diagram with invariant reactions. | 2 | 3 | 10 |
| <b>UNIT-3</b> |  |   |   |   |    |
| 6.            |  | Draw isothermal transformation curves for a eutectoid steel and explain                                   | 3 | 3 | 10 |

|            |   |          |          |           |
|------------|---|----------|----------|-----------|
|            | it.   |          |          |           |
|            | <b>OR</b>   |          |          |           |
| <b>7.</b>  | Explain about Carburizing and Nitriding process.  | <b>3</b> | <b>2</b> | <b>10</b> |
|            |   |          |          |           |
|            | <b>UNIT-4</b>   |          |          |           |
| <b>8.</b>  | Explain with neat sketch of the microstructure and properties of different types of cast irons? | <b>4</b> | <b>3</b> | <b>10</b> |
|            | <b>OR</b>   |          |          |           |
| <b>9.</b>  | Explain in detail about copper and its alloys.  | <b>4</b> | <b>2</b> | <b>10</b> |
|            |   |          |          |           |
|            | <b>UNIT-5</b>   |          |          |           |
| <b>10.</b> | Discuss the basic steps involved in Powder Metallurgy with neat sketches.                       | <b>5</b> | <b>3</b> | <b>10</b> |
|            | <b>OR</b>   |          |          |           |
| <b>11.</b> | Discuss briefly the classification of composites and its fabrication using Spray Layup method.  | <b>5</b> | <b>3</b> | <b>10</b> |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 10 marks



Course Code: B23HS2201

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

R23

II B.Tech. II Semester MODEL QUESTION PAPER

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(Common to AIDS, CSE, CIC, CSG, CSIT, CE, ECE, EEE, ME)

Time: 3 Hrs.

Max. Marks: 70 M

Answer Question No.1 compulsorily

Answer **ONE Question** from **EACH UNIT**

Assume suitable data if necessary

10 x 2 = 20 Marks

|    |    |  | CO | KL | M |
|----|----|--|----|----|---|
| 1. | a) | Define Managerial Economics.                                 | 1  | 1  | 2 |
|    | b) | State the Importance of Demand forecasting.                  | 1  | 1  | 2 |
|    | c) | Write about Fixed cost and Variable cost.                    | 2  | 1  | 2 |
|    | d) | List out the Applications of Break-even analysis.            | 2  | 1  | 2 |
|    | e) | Define Double Entry System of Accounting.                    | 3  | 1  | 2 |
|    | f) | List the items under Current assets and Current liabilities. | 4  | 1  | 2 |
|    | g) | Name the types of Imperfect Competition.                     | 5  | 1  | 2 |
|    | h) | Identify the methods of Internet Pricing.                    | 5  | 1  | 2 |
|    | i) | Show the components of working capital cycle.                | 6  | 1  | 2 |
|    | j) | Write the importance of Depreciation.                        | 6  | 1  | 2 |

Estd. 1980

AUTONOMOUS

5 x 10 =50Marks

| UNIT-1        |    |  |   |   |   |
|---------------|----|--|---|---|---|
| 2.            | a) | Compare the differences between Micro and Macro Economics.                     | 1 | 2 | 5 |
|               | b) | Explain the Scope of Managerial Economics.                                     | 1 | 2 | 5 |
| <b>OR</b>     |    |  |   |   |   |
| 3.            | a) | Explain the determinants of Demand.  | 1 | 2 | 5 |
|               | b) | Describe the types of Elasticity of Demand.                                    | 1 | 2 | 5 |
| <b>UNIT-2</b> |    |  |   |   |   |
| 4.            | a) | Illustrate the Elements of costs with suitable examples.                       | 2 | 2 | 5 |
|               | b) | Define Cost. Explain the types of Costs.                                       | 2 | 2 | 5 |
| <b>OR</b>     |    |  |   |   |   |
| 5.            | a) | Interpret the determination of Break-even point with graphical representation. | 2 | 2 | 5 |
|               | b) | Identify the Assumptions and Limitations of Break-even analysis.               | 2 | 2 | 5 |

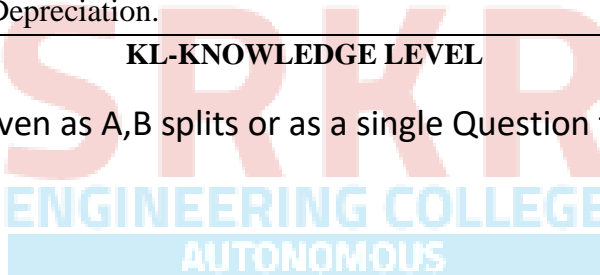
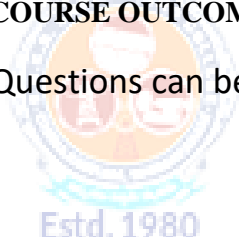
| <b>UNIT-3</b> |           |  |          |          |           |
|---------------|-----------|--|----------|----------|-----------|
| <b>6.</b>     |           | Write the importance of Accounting and explain the types of accounts with rules governing each account.            | <b>3</b> | <b>2</b> | <b>10</b> |
| <b>OR</b>     |           |  |          |          |           |
| <b>7.</b>     |           | Illustrate the proforma for Trading and Profit and loss account and Balance sheet including items in each account. | <b>4</b> | <b>2</b> | <b>10</b> |
| <b>UNIT-4</b> |           |  |          |          |           |
| <b>8.</b>     | <b>a)</b> | Outline the salient features of Perfect competition.   | <b>5</b> | <b>2</b> | <b>5</b>  |
|               | <b>b)</b> | Discuss the features of Oligopoly.   | <b>5</b> | <b>2</b> | <b>5</b>  |
| <b>OR</b>     |           |  |          |          |           |
| <b>9.</b>     | <b>a)</b> | Explain different methods of Cost Based Pricing.   | <b>5</b> | <b>2</b> | <b>5</b>  |
|               | <b>b)</b> | Describe the Competition Based pricing methods.  | <b>5</b> | <b>2</b> | <b>5</b>  |
| <b>UNIT-5</b> |           |  |          |          |           |
| <b>10.</b>    | <b>a)</b> | Discuss the factors influencing Working capital.   | <b>5</b> | <b>2</b> | <b>5</b>  |
|               | <b>b)</b> | Explain the Sources of Raising finance in long term.   | <b>5</b> | <b>2</b> | <b>5</b>  |
| <b>OR</b>     |           |  |          |          |           |
| <b>11.</b>    | <b>a)</b> | Define Depreciation. Explain the causes of Depreciation in detail.   | <b>6</b> | <b>2</b> | <b>5</b>  |
|               | <b>b)</b> | Explain the methods of Depreciation.   | <b>6</b> | <b>2</b> | <b>5</b>  |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 10 marks



## II B.Tech. II Semester MODEL QUESTION PAPER

## COMPLEX VARIABLE AND STATISTICAL METHODS

For ME

Time: 3 Hrs.

Max. Marks: 70 M

Answer Question No.1 compulsorily

Answer **ONE Question** from **EACH UNIT**

Assume suitable data if necessary

10 x 2 = 20 Marks

|    |     |   | CO | KL | M |
|----|-----|---|----|----|---|
| 1. | (a) | Define analytic function.   | 1  | 1  | 2 |
|    | (b) | State Cauchy's integral theorem   | 1  | 1  | 2 |
|    | (c) | Define isolated singularity and give an example   | 2  | 1  | 2 |
|    | (d) | State Residue's theorem.  | 2  | 1  | 2 |
|    | (e) | State Baye's theorem.   | 3  | 1  | 2 |
|    | (f) | The diameter of an electric cable is assumed to be a continuous variate with p.d.f. $f(x)=6x(1-x)$ , $0 \leq x \leq 1$ . Find the mean. | 3  | 3  | 2 |
|    | (g) | Write any two properties of $\chi^2$ - distribution   | 4  | 2  | 2 |
|    | (h) | Explain Point and Interval estimations  | 4  | 2  | 2 |
|    | (i) | Define Type-I and Type-II errors  | 5  | 1  | 2 |
|    | (j) | Define standard error of a statistic.   | 5  | 1  | 2 |

5 x 10 = 50 Marks

## UNIT-I

|    |     |   |   |   |   |
|----|-----|---|---|---|---|
| 2. | (a) | Prove that $z + 2\bar{z}$ is not analytic anywhere in the complex plane   | 1 | 3 | 5 |
|    | (b) | Show that the function $u = e^y \sin y$ is harmonic and find the conjugate function $v$ .   | 1 | 3 | 5 |
|    |     | <b>OR</b>   |   |   |   |
| 3. | (a) | If $f(z) = u + iv$ is an analytic function of $z = x + iy$ , prove that $\left[\frac{\partial}{\partial x}  f(z) \right]^2 + \left[\frac{\partial}{\partial y}  f(z) \right]^2 =  f'(z) ^2$ . | 1 | 3 | 5 |
|    | (b) | Use Cauchy's integral formula to evaluate $\oint_C \frac{z^2+1}{z(2z+1)} dz$ , where C is $ z  = 1$   | 1 | 3 | 5 |

| UNIT-II         |     |  |   |    |    |    |    |     |     |     |     |   |    |   |
|-----------------|-----|--|---|----|----|----|----|-----|-----|-----|-----|---|----|---|
| 4.              | (a) | Using Residue theorem, evaluate the $\int_C \frac{e^z}{z^2+1} dz$ ,<br>where C is the circle $ z  = 2$ .   |   |    |    |    |    |     |     |     | 3   | 3 | 5  |   |
|                 | (b) | Expand $f(z) = \frac{(z-2)(z+2)}{(z+1)(z+4)}$ as Laurent series in the region<br>(i) $1 <  z  < 4$ (ii) $ z  < 1$ and (iii) $ z  > 4$ .  |   |    |    |    |    |     |     |     | 2   | 3 | 5  |   |
| <b>OR</b>       |     |  |   |    |    |    |    |     |     |     |     |   |    |   |
| 5.              |     | Apply the calculus of Residues to evaluate $\int_0^{2\pi} \frac{1}{5-3\cos\theta} d\theta$ .   |   |    |    |    |    |     |     |     | 2   | 3 | 10 |   |
| <b>UNIT-III</b> |     |  |   |    |    |    |    |     |     |     |     |   |    |   |
| 6.              | (a) | A random variable X has the following probability distribution.  |   |    |    |    |    |     |     |     | 3   | 3 | 5  |   |
|                 |     | Value of X   | 0 | 1  | 2  | 3  | 4  | 5   | 6   | 7   |     |   |    | 8 |
|                 |     | P(X)   | a | 3a | 5a | 7a | 9a | 11a | 13a | 15a | 17a |   |    |   |
|                 |     | Determine (i) the value of 'a' and (ii) the distribution function of X   |   |    |    |    |    |     |     |     |     |   |    |   |
|                 | (b) | X is a normal variate with mean 30 and standard deviation 5. Find the probability that (i) $26 \leq X \leq 40$ (ii) $X \geq 45$ .  |   |    |    |    |    |     |     |     | 3   | 3 | 5  |   |
| <b>OR</b>       |     |  |   |    |    |    |    |     |     |     |     |   |    |   |
| 7.              | (a) | If 2% of light bulbs are defective, find (i) at least one is defective<br>(ii) Exactly 7 are defective in a sample of 100  |   |    |    |    |    |     |     |     | 3   | 3 | 5  |   |
|                 | (b) | The mean and variance of a binomial distribution are 4 and 4/3 respectively. Find $P(X \geq 1)$ .  |   |    |    |    |    |     |     |     | 3   | 3 | 5  |   |
| <b>UNIT-IV</b>  |     |  |   |    |    |    |    |     |     |     |     |   |    |   |
| 8.              |     | A population consists of five numbers 2, 3, 6, 8 and 11. Consider all possible samples of size two which can be drawn with replacement from this population. Find (i) The mean of the population (ii) The standard deviation of the population (iii) The mean of the sample distribution of means (iv) The standard deviation of the sampling distribution of means. |   |    |    |    |    |     |     |     | 4   | 3 | 10 |   |
| <b>OR</b>       |     |  |   |    |    |    |    |     |     |     |     |   |    |   |
| 9.              |     | A random sample of 10 ball bearings produced by a company have a mean diameter of 0.506cm with standard deviation 0.004cm. Find the maximum error estimate E and 95% confidence interval for the actual mean of ball bearings produced by this company assuming sampling from normal population.   |   |    |    |    |    |     |     |     | 4   | 3 | 10 |   |
| <b>UNIT-V</b>   |     |  |   |    |    |    |    |     |     |     |     |   |    |   |
| 10.             | (a) | A group of 10 boys fed on Diet-A and another group of 8 boys fed on a different Diet-B. They recorded the following increase in weight (kgs)   |   |    |    |    |    |     |     |     | 5   | 3 | 5  |   |
|                 |     | Diet-A   | 5 | 6  | 8  | 1  | 12 | 4   | 3   | 9   |     |   |    | 6 |

|     |     |   |   |   |   |   |    |   |   |   |  |   |   |    |  |
|-----|-----|---|---|---|---|---|----|---|---|---|--|---|---|----|--|
|     |     | Diet-B  | 2 | 3 | 6 | 8 | 10 | 1 | 2 | 8 |  |   |   |    |  |
|     |     | Does it show the superiority of Diet-A over the Diet-B?   |   |   |   |   |    |   |   |   |  |   |   |    |  |
|     | (b) | In a large City-A, 20% of a random sample of 900 school children had defective eye-sight. In another large City-B, 15% of random sample of 1600 children had the same defective. Is the difference between the two proportions significant? |   |   |   |   |    |   |   |   |  | 5 | 3 | 5  |  |
|     |     | <b>OR</b>   |   |   |   |   |    |   |   |   |  |   |   |    |  |
| 11. |     | The number of automobile accidents per week in a certain community are 12, 8, 20, 2, 14, 10, 15, 6, 9, 4. Are these frequencies in agreement with the belief that accident conditions were the same during this week period.                |   |   |   |   |    |   |   |   |  | 5 | 3 | 10 |  |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 10 marks



## II B.Tech. II Semester MODEL QUESTION PAPER

## MANUFACTURING PROCESSES

For ME

Time: 3 Hrs.

Max. Marks: 70 M

Answer Question No.1 compulsorily

Answer **ONE Question** from **EACH UNIT**

Assume suitable data if necessary

10 x 2 = 20 Marks

|    |     |  | CO | KL | M |
|----|-----|--|----|----|---|
| 1. | a). | What are the different pattern allowances            | 1  | 1  | 2 |
|    | b). | Classify various properties of moulding sand         | 1  | 2  | 2 |
|    | c). | What is meant by solid state welding                 | 2  | 1  | 2 |
|    | d). | List out various welding defects                     | 2  | 1  | 2 |
|    | e). | Explain about Tube drawing                           | 3  | 2  | 2 |
|    | f). | Define Annealing process                             | 3  | 1  | 2 |
|    | g). | Explain the concept of spring back                   | 4  | 2  | 2 |
|    | h). | Explain about Coining process                        | 4  | 2  | 2 |
|    | i). | Explain the advantages of AM                         | 5  | 2  | 2 |
|    | j). | What are the various Steps in Additive Manufacturing | 5  | 1  | 2 |

Estd. 1980

AUTONOMOUS

5 x 10 = 50 Marks

| UNIT-1        |  |  |   |   |    |
|---------------|--|--|---|---|----|
| 2.            |  | Identify various patterns used for casting process with neat sketches.                   | 1 | 3 | 10 |
| <b>OR</b>     |  |  |   |   |    |
| 3.            |  | Apply the principles of investment casting to explain the stages involved in the process | 1 | 3 | 10 |
| <b>UNIT-2</b> |  |  |   |   |    |
| 4.            |  | Differentiate between MIG and TIG welding.   | 2 | 3 | 10 |
| <b>OR</b>     |  |  |   |   |    |
| 5.            |  | Demonstrate any two types of resistance welding's with a neat sketches.                  | 2 | 3 | 10 |
| <b>UNIT-3</b> |  |  |   |   |    |
| 6.            |  | Apply the concept of hot rolling and explain its types                                   | 3 | 3 | 10 |
| <b>OR</b>     |  |  |   |   |    |
| 7.            |  | Identify the differences between hot working and cold working process.                   | 3 | 3 | 10 |



| <b>UNIT-4</b> |  |   |          |          |           |
|---------------|--|---|----------|----------|-----------|
| <b>8.</b>     |  | Apply the concept of high energy rate forging by explaining it with a neat sketch and discussing its advantages.          | <b>4</b> | <b>3</b> | <b>10</b> |
| <b>OR</b>     |  |   |          |          |           |
| <b>9.</b>     |  | Demonstrate blanking, piercing and stretch forming with a neat sketch.  | <b>4</b> | <b>3</b> | <b>10</b> |
| <b>UNIT-5</b> |  |   |          |          |           |
| <b>10.</b>    |  | Apply your understanding to describe the main features of VAT photo polymerization in the additive manufacturing process. | <b>5</b> | <b>3</b> | <b>10</b> |
| <b>OR</b>     |  |   |          |          |           |
| <b>11.</b>    |  | Explain the direct energy deposition process in additive manufacturing and identify its main characteristics."            | <b>5</b> | <b>3</b> | <b>10</b> |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE: Questions can be given as A,B splits or as a single Question for 10 marks



Course Code: B23ME2202

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

R23

II B.Tech. II Semester MODEL QUESTION PAPER

THERMAL ENGINEERING

For ME

Time: 3 Hrs.

Max. Marks: 70 M

Answer Question No.1 compulsorily

Answer **ONE Question** from **EACH UNIT**

Assume suitable data if necessary

10 x 2 = 20 Marks

|    |     |  | CO | KL | M |
|----|-----|--|----|----|---|
| 1. | a). | Define Dryness fraction  | 1  | 1  | 2 |
|    | b). | List out the applications of Steam in industry.                  | 1  | 1  | 2 |
|    | c). | What is a Binary vapor power cycle                               | 2  | 1  | 2 |
|    | d). | What are the different operations of a Rankine cycle.            | 2  | 1  | 2 |
|    | e). | What are the types of Nozzles?                                   | 3  | 1  | 2 |
|    | f). | What are the reasons for the reduction of efficiency of Nozzles? | 3  | 2  | 2 |
|    | g). | What is a Parson's reaction turbine?                             | 4  | 2  | 2 |
|    | h). | Define degree of reaction.                                       | 4  | 1  | 2 |
|    | i). | What is the basic working principle of a Steam condenser?        | 5  | 2  | 2 |
|    | j). | What are the sources of Air leakages in condensers?              | 5  | 2  | 2 |

Estd. 1980

AUTONOMOUS

5 x 10 = 50 Marks

|    |  | UNIT-1  |   |   |    |
|----|--|---|---|---|----|
| 2. |  | A pressure cooker contains 1.5 Kg of steam at 5 bar and 0.9 dryness when the gas was switched-off. Determine the quantity of heat rejected by the pressure cooker when the pressure in the cooker falls to 1 bar. | 1 | 3 | 10 |
|    |  | <b>OR</b>   |   |   |    |
| 3. |  | Explain in detail with neat sketch the working of throttling calorimeter. Also derive formula for dryness fraction of steam.  | 1 | 3 | 10 |
|    |  | <b>UNIT-2</b>   |   |   |    |
| 4. |  | What is Regenerative Rankine cycle and derive the expression for the thermal efficiency of a Regenerative Rankine cycle and plot it on a T-s plane.   | 2 | 3 | 10 |
|    |  | <b>OR</b>   |   |   |    |
| 5. |  | In a steam power plant working on ideal Rankine cycle, the steam turbine receives steam at 10 bar 250°C and discharges at 0.5 bar. Find the thermal efficiency.   | 2 | 3 | 10 |



## II B.Tech. II Semester MODEL QUESTION PAPER

## THEORY OF MACHINES

For ME

Time: 3 Hrs.

Max. Marks: 70 M

Answer Question No.1 compulsorily

Answer **ONE Question** from **EACH UNIT**

Assume suitable data if necessary

10 x 2 = 20 Marks

|    |     |  | CO | KL | M |
|----|-----|--|----|----|---|
| 1. | a). | Difference between mechanism and structure         | 1  | 2  | 2 |
|    | b). | Define Degrees of freedom                          | 1  | 1  | 2 |
|    | c). | Explain about Velocity of rubbing                  | 2  | 3  | 2 |
|    | d). | State three centers in line theorem                | 2  | 1  | 2 |
|    | e). | Define Gyroscopic couple                           | 3  | 1  | 2 |
|    | f). | Write a short note on interference in gear profile | 3  | 2  | 2 |
|    | g). | What is the need of balancing in rotating machines | 4  | 2  | 2 |
|    | h). | Difference between Radial and off-set followers    | 4  | 3  | 2 |
|    | i). | What are the various types of vibrations           | 5  | 1  | 2 |
|    | j). | Define piston effort                               | 5  | 1  | 2 |

Estd. 1980

AUTONOMOUS

5 x 10 = 50 Marks

| UNIT-1        |  |  |   |   |    |
|---------------|--|--|---|---|----|
| 2.            |  | Explain about various inversions of single slider crank mechanism with application   | 1 | 2 | 10 |
| <b>OR</b>     |  |  |   |   |    |
| 3.            |  | The driving shaft of a Hooke's joint rotates at a uniform speed of 400rpm. If the maximum variation in speed of the driven shaft is $\pm 5\%$ of the mean speed, determine the greatest permissible angle between the axes of the shafts. What are the maximum and the minimum speeds of the driven shafts?  | 1 | 3 | 10 |
| <b>UNIT-2</b> |  |  |   |   |    |
| 4.            |  | The crank and connecting rod of a theoretical steam engine are 0.5 m and 2 m long respectively. The crank makes 180 rpm in the clockwise direction. When it has turned $45^\circ$ from the inner dead center position, determine: 1. velocity of piston, 2. angular velocity of connecting rod, 3. velocity of point E on the connecting rod 1.5 m from the gudgeon pin, 4. velocities of rubbing at the pins of the crank shaft, crank and crosshead when the diameters of their pins are 50 mm, 60 mm and 30 mm respectively | 2 | 3 | 10 |

|     |  |  |   |   |    |
|-----|--|--|---|---|----|
|     |  | <b>OR</b>  |   |   |    |
| 5.  |  | Derive the expression for Coriolis component of acceleration   | 2 | 3 | 10 |
|     |  |  |   |   |    |
|     |  | <b>UNIT-3</b>  |   |   |    |
| 6.  |  | Explain the gyroscopic couple effect on the motion of an aircraft while taking a turn  | 3 | 2 | 10 |
|     |  |  |   |   |    |
|     |  | <b>OR</b>  |   |   |    |
| 7.  |  | Derive the expression for Constant Velocity Ratio of Toothed Wheels– Law of Gearing  | 3 | 3 | 10 |
|     |  |  |   |   |    |
|     |  | <b>UNIT-4</b>  |   |   |    |
| 8.  |  | A shaft carries four masses A, B, C and D of magnitude 200 kg, 300 kg, 400 kg and 200 kg respectively and revolving at radii 80 mm, 70 mm, 60 mm and 80 mm in planes measured from A at 300 mm, 400 mm and 700 mm. The angles between the cranks measured anticlockwise are A to B 45°, B to C 70° and C to D 120°. The balancing masses are to be placed in planes X and Y. The distance between the planes A and X is 100 mm, between X and Y is 400mm and between Y and D is 200 mm. If the balancing masses revolve at a radius of 100 mm, determine their magnitudes and angular positions. | 4 | 3 | 10 |
|     |  |  |   |   |    |
|     |  | <b>OR</b>  |   |   |    |
| 9.  |  | Draw the profile of a cam operating a Knife- edge follower having a lift of 30 mm. The cam raises the follower with SHM for 1500 of the rotation followed by a period of dwell for 600. The follower descends for the next 1000 rotation of the cam with uniform velocity, again followed by a dwell period. The cam rotates at uniform velocity of 120rpm and has a least radius of 20mm. What will be the maximum velocity and acceleration of the follower during the lift and the return?  | 4 | 3 | 10 |
|     |  |  |   |   |    |
|     |  | <b>UNIT-5</b>  |   |   |    |
| 10. |  | The measurements on a mechanical vibrating system show that it has a mass of 8 kg and that the springs can be combined to give an equivalent spring of stiffness 5.4 N/mm. If the vibrating system have a dashpot attached which exerts a force of 40 N when the mass has a velocity of 1 m/s, determine: 1. critical damping coefficient, 2. damping factor, 3. Logarithmic decrement, and 4. ratio of two consecutive amplitudes   | 5 | 3 | 10 |
|     |  |  |   |   |    |
|     |  | <b>OR</b>  |   |   |    |
| 11. |  | The turning moment diagram for a petrol engine is drawn to the followingscales : 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 <sup>2</sup> . 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  | 5 | 3 | 10 |

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE: Questions can be given as A,B splits or as a single Question for 10 marks