## University of Mumbai

Examination 2020
Program: Civil Engineering
Curriculum Scheme: Rev2016
Examination: Second Year Semester V
Course Code: CEC403 and Course Name: Structural Analysis-I
Time: 1 hour
Max. Marks: 50

For the students:- All the Questions are compulsory and carry equal marks .

| Q1. | At hinge, the moments will be |
| :---: | :--- |
| Option A: | Maximum |
| Option B: | Minimum |
| Option C: | Uniform |
| Option D: | Zero |
|  |  |
| Q2. | What is variation in SFD, if the type of loading in the simply supported beam is <br> U.D.L is |
| Option A: | Rectangle |
| Option B: | Linear |
| Option C: | Trapezoidal |
| Option D: | Parabolic |
|  |  |
| Q3. | The Castigliano's second theorem can be used to compute deflections |
| Option A: | In statically determinate structures only |
| Option B: | For any type of structure |
| Option C: | At the point under the load only |
| Option D: | For beams and frames only |
|  |  |
| Q4. | The principle of virtual work can be applied to elastic system by considering the <br> virtual work of |
| Option A: | internal forces only |
| Option B: | External forces only |
| Option C: | internal as well as external forces |
| Option D: | Inclined Forces |
|  |  |
| Q5. | The rate of change of shear force is equal to |
| Option A: | Direction of load |
| Option B: | Change in BMD |
| Option C: | Intensity of loading |
| Option D: | Maximum bending |
|  |  |
| Q6. | In simply supported beams, the slope is |
| Option A: | Minimum |
| Option B: | Maximum |
| Option C: | Zero |
| Option D: | Uniform |
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| Q7. | In simply supported beam deflection is maximum at |
| :---: | :---: |
| Option A: | Midspan |
| Option B: | Supports |
| Option C: | Point of loading |
| Option D: | Throughout |
| Q8. | The ratio of maximum deflection of a beam to its $\qquad$ is called stiffness of the beam. |
| Option A: | Load |
| Option B: | Span |
| Option C: | Slope |
| Option D: | Reaction at the support |
|  |  |
| Q9. | In cantilever beam the deflection occurs at |
| Option A: | Free end |
| Option B: | Point of loading |
| Option C: | Through out |
| Option D: | Fixed end |
| Q10. | Compute the maximum deflection at free end of a cantilever beam subjected to udl for entire span of $L$ metres. |
| Option A: | $\mathrm{wl}^{4} / \mathbf{8 E I}$ |
| Option B: | $\mathrm{wl}^{4} / 4 \mathrm{EI}$ |
| Option C: | $\mathrm{wl}^{3} / 8 \mathrm{EI}$ |
| Option D: | $\mathrm{wl}^{2} / 6 \mathrm{EI}$ |
|  |  |
| Q11. | Calculate the slope in a simply supported beam subjected to point load at centre. Take the EI into consideration. |
| Option A: | $\mathrm{Wl}^{3} / 4 \mathrm{EI}$ |
| Option B: | $\mathrm{Wl}^{3} / 16 \mathrm{EI}$ |
| Option C: | $\mathrm{Wl}^{3} / 8 \mathrm{EI}$ |
| Option D: | $\mathrm{Wl}^{4} / 6 \mathrm{EI}$ |
|  |  |
| Q12. | In a cantilever of span "L" subjected to a concentrated load of "W" at a distance of $L / 3$ from free end. The deflection is |
| Option A: | WL ${ }^{3} 3 \mathrm{EI}$ |
| Option B: | $14 \mathrm{WL}^{3} / 81 \mathrm{EI}$ |
| Option C: | $\mathrm{WL}^{3} / 81 \mathrm{EI}$ |
| Option D: | 8WL ${ }^{3} / 81$ EI |
|  |  |
| Q13. | Which of the following method is used to determine the slope and deflection at a point? |
| Option A: | Arithmetic increase method |
| Option B: | Mathematical curve setting |
| Option C: | Macaulay's method |
| Option D: | Lacey's method |
|  |  |
| Q14. | In cantilever beams, the deflection is zero at |

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| Option A: | Free end |
| :---: | :---: |
| Option B: | Fixed end |
| Option C: | At supports |
| Option D: | Through out |
| Q15. | For drawing ILD, what value of test load is assumed? |
| Option A: | 1 unit |
| Option B: | Arbitrary |
| Option C: | Depends upon structure |
| Option D: | 0 |
| Q16. | If we require to construct ILD of vertical support at a pin joint, then according to Muller-Breslau principle, by which type of support should it be replaced? |
| Option A: | Roller guide |
| Option B: | Pin roller |
| Option C: | Fixed support |
| Option D: | Hinge |
| Q17. | What will be the shape of ILD curve for vertical reaction at left point in simply supported beam? |
| Option A: | Triangular |
| Option B: | Circular |
| Option C: | Rectangular |
| Option D: | Trapezoidal |
| Q18. | In influence line diagrams (ILD) :- |
| Option A: | Points remain fixed, position of load changes |
| Option B: | Points change, position of loads remain fixed |
| Option C: | position of load changes only |
| Option D: | Points change only |
|  |  |
| Q19. | Top most part of an arch is called |
| Option A: | Sofit |
| Option B: | Crown |
| Option C: | Center |
| Option D: | Abutment |
|  |  |
| Q20. | Shape of three hinged arch is always |
| Option A: | Hyperbolic |
| Option B: | Circular |
| Option C: | Parabolic |
| Option D: | Can be any arbitrary curve |
|  |  |
| Q21. | Internal bending moment generated in a three hinged arch is always:- |
| Option A: | 0 |
| Option B: | Infinite |
| Option C: | Varies |
| Option D: | Non zero value but remains constant |

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| :---: | :--- |
| Q22. | For a given material length, end conditions and equal area the shape of the <br> column which is most efficient as per Euler's is |
| Option A: | Square |
| Option B: | Circular |
| Option C: | I section |
| Option D: | Tubular |
|  |  |
| Q23. | What is the rankines constant for cast iron? |
| Option A: | $1 / 2000$ |
| Option B: | $1 / 2400$ |
| Option C: | $\mathbf{1 / 1 6 0 0}$ |
| Option D: | $1 / 1800$ |
|  |  |
| Q24. | Unsymmetrical bending occurs due to |
| Option A: | The Beam cross section is unsymmetrical |
| Option B: | The shear Centre does not coincide with the neutral axis |
| Option C: | The Beam is subjected to trust in addition to bending moment |
| Option D: | The bending moment diagram is unsymmetrical |
|  |  |
| Q25. | The shear centre of the section is defined as the point |
| Option A: | Through which load must be applied to produce zero twisting moment on the <br> section |
| Option B: | At which SF is zero |
| Option C: | At which SF is maximum |
| Option D: | At which SF is minimum |

