Program: BE Mechanical Engineering

Curriculum Scheme: R12

Examination: Third Year SemesterVI

Course Code: MEC602 and Course Name: Machine Design-I

Time: 1hour Max. Marks: 50

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

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| Q1.  | According to Indian standard specifications, a plain carbon steel designated by 40C8 means that |
| Option A: | carbon content is 0.04 per cent and manganese is 0.08 per cent |
| Option B: | carbon content is 0.4 per cent and manganese is 0.8 per cent |
| Option C: | carbon content is 0.35 to 0.45 per cent and manganese is 0.60 to 0.90 per cent |
| Option D:  | carbon content is 0.60 to 0.80 per cent and manganese is 0.8 to 1.2 per cent |
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| Q2. | The material commonly used for crane hooks is |
| Option A: | cast iron |
| Option B: | wrought iron |
| Option C: | mild steel |
| Option D: | Aluminium |
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| Q3. | A localised compressive stress at the area of contact between two members is known as |
| Option A: | tensile stress |
| Option B: | bending stress |
| Option C: | bearing stress |
| Option D: | shear stress |
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| Q4. | Which of the following material has the maximum ductility? |
| Option A: | Mild steel |
| Option B: | Copper |
| Option C: | Zinc |
| Option D: | Aluminium |
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| Q5. | The neutral axis of a beam is subjected to |
| Option A: | zero stress |
| Option B: | maximum tensile stress |
| Option C: | maximum compressive stress |
| Option D:  | maximum shear stress |
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| Q6. | The bending stress in a curved beam is |
| Option A: | zero at the centroidal axis |
| Option B: | zero at the point other than centroidal axis |
| Option C: | maximum at the neutral axis |
| Option D:  | maximum at the centroidal axis |
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| Q7.  | In case of thick cylinders, the tangential stress across the thickness of cylinder is |
| Option A: | maximum at the outer surface and minimum at the inner surface |
| Option B: | maximum at the inner surface and minimum at the outer surface |
| Option C: | maximum at the inner surface and zero at the outer surface |
| Option D:  | maximum at the outer surface and zero at the inner surface |
|  |  |
| Q8.  | The longitudinal stress is ...... of the circumferential stress. |
| Option A: | one-half |
| Option B: | two-third |
| Option C: | three-fourth |
| Option D:  | one fourth |
|  |  |
| Q9. | While designing a screw in a screw jack against buckling failure, the end conditions for the screw are taken as |
| Option A: | both ends fixed |
| Option B: | both ends hinged |
| Option C: | one end fixed and other end hinged |
| Option D:  | one end fixed and other end free. |
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| Q10.  | Which of the following screw thread is adopted for power transmission in either direction? |
| Option A: | Acme threads |
| Option B: | Square threads |
| Option C: | Buttress threads |
| Option D:  | Multiple threads |
|  |  |
| Q11.  | The eye bolts are used for |
| Option A: | transmission of power |
| Option B: | locking devices |
| Option C: | lifting and transporting heavy machines |
| Option D:  | absorbing shocks and vibrations |
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| Q12.  | In a steam engine, the piston rod is usually connected to the crosshead by means of a |
| Option A: | knuckle joint |
| Option B: | universal joint |
| Option C: | flange coupling |
| Option D: | cotter joint |
|  |  |
| Q13. | A cotter joint is used to transmit |
| Option A: | axial tensile load only |
| Option B: | axial compressive load only |
| Option C: | combined axial and twisting loads |
| Option D:  | axial tensile or compressive loads |
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| Q14.  | The residential compressive stress by way of surface treatment of a machine member subjected to fatigue loading |
| Option A: | improves the fatigue life |
| Option B: | deteriorates the fatigue life |
| Option C: | does not affect the fatigue life |
| Option D:  | immediately fractures the specimen |
|  |  |
| Q15. | Stress concentration factor is defined as the ratio of |
| Option A: | maximum stress to the endurance limit |
| Option B: | nominal stress to the endurance limit |
| Option C: | maximum stress to the nominal stress |
| Option D:  | nominal stress to the maximum stress |
|  |  |
| Q16.  | The endurance or fatigue limit is defined as the maximum value of the stress which a polished standard specimen can withstand without failure, for infinite number of cycles, when subjected to |
| Option A: | static load |
| Option B: | dynamic load |
| Option C: | static as well as dynamic load |
| Option D:  | completely reversed load |
|  |  |
| Q17. | The resistance to fatigue of a material is measured by |
| Option A: | elastic limit |
| Option B: | Young's modulus |
| Option C: | ultimate tensile strength |
| Option D: | endurance limit |
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| Q18. | The sleeve or muff coupling is designed as a |
| Option A: | thin cylinder |
| Option B: | thick cylinder |
| Option C: | solid shaft |
| Option D:  | hollow shaft |
|  |  |
| Q19.  | The maximum shear stress theory is used for |
| Option A: | brittle materials |
| Option B: | ductile materials |
| Option C: | plastic materials |
| Option D:  | non-ferrous materials |
|  |  |
| Q20. | A key made from a cylindrical disc having segmental cross-section, is known as |
| Option A: | feather key |
| Option B: | gib head key |
| Option C: | woodruff key |
| Option D: | flat saddle key |
|  |  |
| Q21. | The type of stresses developed in the key is/are |
| Option A: | shear stress alone |
| Option B: | bearing stress alone |
| Option C: | both shear and bearing stresses |
| Option D:  | shearing, bearing and bending stresses |
|  |  |
| Q22.  | When helical compression spring is cut into halves, the stiffness of the resulting spring will be |
| Option A: | Same |
| Option B: | Double |
| Option C: | one-half |
| Option D:  | one-fourth |
|  |  |
| Q23. | A leaf spring in automobiles is used |
| Option A: | to apply forces |
| Option B: | to measure forces |
| Option C: | to absorb shocks |
| Option D:  | to store strain energy |
|  |  |
| Q24.  | The maximum energy that can be stored in a body due to external loading upto the elastic limit is called |
| Option A: | Resilience |
| Option B: | proof resilience |
| Option C: | strain energy |
| Option D:  | modulus of resilience |
|  |  |
| Q25. | When a helical compression spring is subjected to an axial compressive load, the stress induced in the wire is |
| Option A: | tensile stress |
| Option B: | compressive stress |
| Option C: | shear stress |
| Option D:  | bending stress |