

**University of Mumbai**  
**Examination 2020 under cluster 4 (PCE)**

Program: BE Mechanical Engineering  
Curriculum Scheme: Rev2012  
Examination: Third Year Semester VI  
Course Code: MEC602 and Course Name: Machine Design I

Time: 1 hour

Max. Marks: 50

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

Q1.	In a flange coupling, the flanges are coupled together by means of _____
Option A:	Bolts and nuts
Option B:	Studs
Option C:	Headless taper bolts
Option D:	Rivets
Q2.	Screw used for power transmission should have _____
Option A:	Low efficiency
Option B:	High efficiency
Option C:	Very fine threads
Option D:	Strong teeth
Q3.	If for a curved beam of trapezoidal cross section, radius of neutral axis is 89.1816 mm and radius of centroidal axis is 100mm, then find the bending stress at inner fibre whose radius is 50 mm. Area of cross section of beam is 7200 mm <sup>2</sup> and the beam is loaded with 100 kN of load.
Option A:	97.3 N/mm <sup>2</sup> .
Option B:	95.8 N/mm <sup>2</sup> .
Option C:	100.6 N/mm <sup>2</sup> .
Option D:	110.2 N/mm <sup>2</sup> .
Q4.	The reliability factor for using 50% reliability in design is
Option A:	0.897
Option B:	1
Option C:	0.868
Option D:	0.814
Q5.	_____ is used in mechanical wrist watches.
Option A:	Belleville spring
Option B:	Torsion spring
Option C:	Leaf spring
Option D:	Helical compression spring
Q6.	Deformation that occurs due to stress over a period of time is known as _____
Option A:	Tensile strength
Option B:	Yield strength
Option C:	Modulus of elasticity
Option D:	Modulus of elasticity

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Q7.	A taper key which fits half in the key way of the hub and half in the key way of shaft, is known as _____
Option A:	sunk key
Option B:	flat saddle key
Option C:	hollow saddle key
Option D:	tangent key
Q8.	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
Q9.	In leaf springs, the longest leaf is known as
Option A:	Master leaf
Option B:	Lower leaf
Option C:	Upper leaf
Option D:	Graduated leaf
Q10.	In welded joint, if size of the weld is 6mm. Find the throat thickness of the weld.
Option A:	4.24 mm
Option B:	8.22 mm
Option C:	12 mm
Option D:	10 mm
Q11.	The taper on key is given on _____
Option A:	bottom side only
Option B:	top side only
Option C:	on both sides
Option D:	any side
Q12.	If mean coil diameter 24 mm and wire diameter is 4 mm, what is the value spring index
Option A:	8
Option B:	6
Option C:	96
Option D:	1/6
Q13.	The piston rod of a steam engine is usually connected to the crosshead by means of _____
Option A:	Universal joint
Option B:	Universal coupling
Option C:	Knuckle joint
Option D:	Cotter joint.
Q14.	A flange coupling is
Option A:	Used for non-collinear shafts
Option B:	Used for collinear shafts

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Option C:	Flexible
Option D:	Used only on small shafts rotating at slow speeds
Q15.	Neutral axis of a beam always coincides with
Option A:	Axis passing through bottom of beam
Option B:	Axis passing through height $h/2$ from bottom
Option C:	Axis passing through height $h/3$ from bottom
Option D:	Axis passing through Centroid
Q16.	A screw is specified by its _____
Option A:	Major Diameter
Option B:	Minor diameter
Option C:	Pitch diameter.
Option D:	Pitch.
Q17.	The _____ is used to adjust axial length between two rods.
Option A:	Cotter joint
Option B:	Knuckle joint
Option C:	Turn buckle
Option D:	Coupling
Q18.	In welded joint the minimum area of the weld is obtained at
Option A:	The throat thickness.
Option B:	The leg size.
Option C:	The length of the weld.
Option D:	The height of the weld.
Q19.	A symbol Fe360 indicates a steel with
Option A:	Minimum Tensile Strength $360 \text{ N/mm}^2$
Option B:	Minimum Tensile Strength $360 \text{ N/mm}^2$
Option C:	Maximum Tensile Strength $360 \text{ N/mm}^2$
Option D:	Minimum shear Strength $360 \text{ N/mm}^2$
Q20.	The approximate relationship between endurance limit of rotating beam specimen ( $S_e$ ) and ultimate tensile strength ( $S_{ut}$ ), in case of steel component, is _____
Option A:	$S_e = 0.4 S_{ut}$
Option B:	$S_e = 0.75 S_{ut}$
Option C:	$S_e = 0.577 S_{ut}$
Option D:	$S_e = 0.5 S_{ut}$
Q21.	Guest's theory of failure is applicable for following type of materials
Option A:	Brittle
Option B:	Ductile
Option C:	Elastic
Option D:	Plastic

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Q22.	The load required to produce a unit deflection in the spring is called _____
Option A:	Modulus of Rigidity
Option B:	Spring stiffness
Option C:	Flexural rigidity
Option D:	Tensional rigidity
Q23.	The sleeve or muff coupling is designed as a
Option A:	Dun cylinder
Option B:	Hollow shaft
Option C:	Solid shaft
Option D:	Thick cylinder
Q24.	A circular shaft can transmit a torque of 5 kN-m. If the torque is reduced to 4 kN-m, then the maximum value of bending moment that can be applied to the shaft is _____
Option A:	1 kN-m
Option B:	2 kN-m
Option C:	3 kN-m
Option D:	4 kN-m
Q25.	A stress that varies in sinusoidal manner with respect to time from a minimum value to maximum value and which has some mean as well as amplitude value is called _____
Option A:	reversed stress
Option B:	fluctuating stress
Option C:	repeated stress
Option D:	varying stress

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<b>Question</b>	<b>Correct Option (Enter either 'A' or 'B' or 'C' or 'D')</b>
Q1.	A
Q2.	B
Q3.	C
Q4	B
Q5	B
Q6	B
Q7	A
Q8.	A
Q9.	A
Q10.	A
Q11.	B
Q12.	B
Q13.	D
Q14.	B
Q15.	D
Q16.	A
Q17.	C
Q18.	A
Q19.	A
Q20.	D
Q21.	B
Q22.	B
Q23.	B
Q24.	C
Q25.	B