

Program: BE Mechanical Engineering

Curriculum Scheme: Revised 2012

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 Questions are compulsory and carry equal marks.

Q1.	Ergonomics is related to human
Option A:	Comfort
Option B:	Qualification
Option C:	Finance
Option D:	Property
Q2.	While designing a forging, the profile is selected such that the fibrous lines are _____ to the tensile forces and perpendicular to shear forces.
Option A:	Parallel
Option B:	not parallel
Option C:	Intersecting
Option D:	non-continuous
Q3.	Which design consideration deals with the appearance of the product?
Option A:	Ergonomics
Option B:	Aesthetics
Option C:	System design
Option D:	Creative design
Q4.	Ergonomics principle suggests that
Option A:	monitoring displays should be placed outside peripheral limitations
Option B:	glow-in-the-dark dials made of reflective substances are good for viewing in the nights
Option C:	visual systems should be preferred over auditory systems in noisy locations
Option D:	parallax error is not a major concern
Q5.	The normal stress is _____ to the area under considerations, while the shear stress acts _____ the area.
Option A:	perpendicular , over
Option B:	over, perpendicular
Option C:	parallel, over
Option D:	over, parallel
Q6.	The stress concentration factor is 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
Q7.	Failure of a material is called fatigue when it <b>fails</b> _____.
Option A:	at the elastic limit
Option B:	below the elastic limit
Option C:	at the yield point
Option D:	below the yield point
Q8.	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
Q9.	The fatigue life of a part can be improved by _____.
Option A:	Electroplating
Option B:	shot peening
Option C:	Polishing
Option D:	Coating
Q10.	Which of the following is the case of maximum wear?
Option A:	Conventional power screw
Option B:	Recirculation power screw
Option C:	Equal in both the cases
Option D:	Wear does not take place in both the cases
Q11.	Find the torque required to raise the load of 15kN and mean diameter of triple threaded screw being 46mm. Also given pitch=8mm and coefficient of friction is 0.15.
Option A:	11831.06 N-mm
Option B:	11813.06 N-mm
Option C:	12811.06 N-mm
Option D:	13111.56 N-mm
Q12.	The bracket welded to the vertical plate by means of two fillet welds. Calculate size of the welds if P=40kN, leg=4mm and e=400mm. Maximum permissible value of shear stress in the weld is 70N/mm <sup>2</sup> .
Option A:	1.4mm
Option B:	1.7mm
Option C:	2.1mm
Option D:	3mm
Q13.	Depending upon the holding arrangement, power screws operate in _____ different arrangements.
Option A:	2
Option B:	3
Option C:	4

Option D:	5
Q14.	Stress variation in an initially curved beam is
Option A:	Linear
Option B:	Parabolic
Option C:	Hyperbolic
Option D:	Random
Q15.	Stress in the outermost fiber of a curved beam is
Option A:	$P/A$
Option B:	$M/Z$
Option C:	$P/A - M/Z$
Option D:	$P/A + M/Z$
Q16.	When the ratio of the inner diameter of the cylinder to the wall thickness is _____ the cylinder is called a thick cylinder.
Option A:	Greater than 150
Option B:	Less than 150
Option C:	Greater than 15
Option D:	Less than 15
Q17.	In thick cylinders, the tangential stress is
Option A:	Highest magnitude at the outer surface of the cylinder and gradually decreases towards the inner surface.
Option B:	Highest magnitude at the inner surface of the cylinder and gradually decreases towards the outer surface.
Option C:	Highest magnitude at the outer surface of the cylinder and zero at the inner surface.
Option D:	Highest magnitude at the inner surface of the cylinder and zero at the outer surface
Q18.	The springs in brakes and clutches are used _____.
Option A:	To apply forces
Option B:	To measure forces
Option C:	To absorb shocks
Option D:	To absorb strain energy
Q19.	The laminated springs are given initial curvature
Option A:	To have uniform strength
Option B:	To make it more economical
Option C:	So that plates may become further curved, when subjected to design load
Option D:	So that plates may become flat, when subjected to design load
Q20.	Which one of the following statements is <b>not</b> a design consideration used for design of a concentric spring?
Option A:	The springs, generally, are made of the same material.
Option B:	They have the same free length
Option C:	They have same solid length

Option D:	The springs are made of the different materials.
Q21.	A railway wagon moving at a velocity of 1.5 m/s is brought to rest by a bumper consisting of helical springs. If the mass of the wagon is 1500 kg, how much strain energy the bumper will store when the mass comes to rest?
Option A:	1687.5 J
Option B:	168.75 J
Option C:	16.875 J
Option D:	1.6875 J
Q22.	Sleeve or muff coupling is designed as _____
Option A:	Dun Cylinder
Option B:	Hollow shaft
Option C:	Solid Shaft
Option D:	Thick Cylinder
Q23.	In a flange coupling the flanges are coupled together by means of _____
Option A:	Nuts and Bolts
Option B:	Studs
Option C:	Headless taper bolts
Option D:	Screws
Q24.	Which of the following statement is correct?
Option A:	Rigid couplings can accommodate misalignments
Option B:	Rigid couplings can absorb shocks and vibrations
Option C:	Rigid couplings are simple in construction as compared to flexible couplings
Option D:	Rigid couplings are costlier than flexible couplings
Q25.	Distribution of forces along the length of key fitted in shaft _____
Option A:	Varies linearly
Option B:	Is uniform through out
Option C:	Varies exponentially, being more near the torque-input end
Option D:	Varies exponentially, being more less the torque-input end