University of Mumbai
Examination 2020

Program: BE Automobile Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester VI

Course Code: AEC602 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 .

Q1.	Material used for machine tool beds is
Option A:	cast iron
Option B:	mild steel
Option C:	high carbon steel
Option D:	alloy steel
Q2.	Which process allows controlling grain structure of the product?
Option A:	Casting
Option B:	Forging
Option C:	None of the mentioned
Option D:	Die Casting
Q3.	The meaning of orange colour is
Option A:	the component is hot
Option B:	the component is safe
Option C:	the component is cold
Option D:	there is a possible danger
Q4.	The centroidal and neutral axes of an initially curved beam are
Option A:	Intersecting
Option B:	Coincident
Option C:	Parallel
Option D:	Perpendicular
Q5.	The variation of bending stress in straight beam is linear whereas the variation of bending stress in curved beam is
Option A:	Linear
Option B:	Parabolic
Option C:	Hyperbolic
Option D:	cubic

Q6.	For high pressure oil and gas cylinders, the thickness of the cylinder is determined by
Option A:	Clavarino's equation
Option B:	Barlow's equation
Option C:	Birnie's equation
Option D:	Lame's equation
Q7.	By using large thread angle in lifting machines
Option A:	the mechanical advantage is more
Option B:	the mechanical advantage is less
Option C:	the load will be sustained in absence of any effort
Option D:	the load is easily lifted
Q8.	The shear plane in case of bolts should be
Option A:	across threaded portion of shank
Option B:	parallel to axis of bolt
Option C:	normal to threaded portion of shank
Option D:	parallel to the cross section of bolt
Q9.	The efficiency is maximum for helix angle between
Option A:	40 to 45°.
Option B:	60 to 75°.
Option C:	70 to 95°.
Option D:	10 to 45°.
Q10.	By using large thread angle in lifting machines
Option A:	the mechanical advantage is more
Option B:	the mechanical advantage is less
Option C:	the load will be sustained in absence of any effort
Option D:	the load is easily lifted
Q11.	The designation M36 x 2 means
Option A:	metric fine threads of 36 mm outside diameter and 2 mm pitch
Option B:	metric coarse threads of 36 mm outside diameter and 2 mm pitch
Option C:	metric threads of 36 mm pitch diameter and 2 mm pitch
Option D:	metric fine threads of 36 mm core diameter and 2 mm pitch
Q12.	If α denotes the lead angle and φ, the angle of friction, then the efficiency of the screw is written as
Option A:	$\tan(\alpha-\varphi)/\tan\alpha$
Option B:	$\tan\alpha/\tan(\alpha-\varphi)$
Option C:	$\tan(\alpha+\varphi)/\tan\alpha$
Option D:	$\tan\alpha/\tan(\alpha+\varphi)$
Q13.	The value 0f notch sensitivity q if fatigue stress concentration factor Kf (=1.378) and theoretical stress concentration factor Kt(=1.42)

Option A:	0.6
Option B:	0.7
Option C:	0.8
Option D:	0.9
Q14.	Which process will increase the fatigue duration of parts
Option A:	finishing and polishing
Option B:	shot-peening
Option C:	decarburisation
Option D:	electroplating
Q15.	When the nominal diameter of the specimen is more than 50 mm, then the value of size factor may be taken as
Option A:	1
Option B:	3.5
Option C:	2
Option D:	0.75
Q16.	In order to have a greater length, it becomes necessary to join two or more pieces of the shaft by means of a
Option A:	welding
Option B:	Coupling
Option C:	wire
Option D:	Universal joint
Q17.	The ratio of strength of a hollow shaft to that of a solid shaft subjected to torsion if both are of the same material and of the same outer diameters, the inner diameter of hollow shaft being half of the outer diameter is
Option A:	15/16
Option B:	16/15
Option C:	16/17
Option D:	8/7
Q18.	The compressive stress induced in a square key due to the transmitted torque is ……………….. the shear stress.
Option A:	Half
Option B:	Equal to
Option C:	thrice
Option D:	twice
Q19.	For a square key made of mild steel, the shear and crushing strengths are related as
Option A:	shear strength = crushing strength
Option B:	shear strength > crushing strength
Option C:	shear strength < crushing strength
Option D:	shear strength + crushing strength

Q20.	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

Q21.	In a flange coupling, the flanges are coupled together by means of
Option A:	Studs
Option B:	Bolts and nuts
Option C:	Headless taper bolts
Option D:	riveted joint

Q22.	The ratio of the mean diameter of the coil to the diameter of the wire is known as
Option A:	Spring rate
Option B:	Spring stiffness
Option C:	Spring constant
Option D:	Spring index

Q23.	The spring mostly used in gramophones is
Option A:	helical spring
Option B:	flat spiral spring
Option C:	laminated spring
Option D:	conical spring

Q24.	In the design of spring, generally the diameter of spring wire is found from...............
Option A:	stress-load relation
Option B:	deflection - load relation
Option C:	spring index
Option D:	spring constant

Q25.	The close-coiled helical springs 'A' and 'B' are of same material, same coil diameter, same wire diameter and subjected to same load. If the number of turns of spring 'A' is half that of spring 'B', the ratio of deflection of spring 'A' to spring 'B' is
Option A:	½
Option B:	1
Option C:	3
Option D:	4