Program: BE Mechanical Engineering

Curriculum Scheme: Revised 2012

Examination: Final Year Semester VIII

Course Code: MEC801 and Course Name: Design of Mechanical System.

Time: 1 hour

Max. Marks: 50

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

Q1.	For structural diagram to be optimum, value of X1 in structural formula should be
Option A:	0
Option B:	2
Option C:	-1
Option D:	1
Q2.	For a given gear box its structural formula and ray formula will be ___
Option A:	Reverse of each other
Option B:	Symmetrical to each other
Option C:	First and last term would be equal
Option D:	Exactly same
Q3.	For a three stage gear box, structural equation would look like
Option A:	(P1)(X1) . (P2)(X2)
Option B:	(P1)(X1) . (P2)(X2) . (P3)(X3)
Option C:	(P1)(X1) . (P2)(X2) . (P3)(X3) . (P4)(X4)
Option D:	(P1)(X1)
Q4.	In a multi stage gearbox design for machine tool application % speed deviation at all times should be less than ____ (ϕ = Geometric progressor)
Option A:	$\pm\, 20(\phi - 1)$
Option B:	$\pm\, 10(\phi - 1)$

Option C:	$\pm 10\phi$
Option D:	$\pm 20\phi$
Q5.	Indicator diagram of a reciprocating pump is a graph between
Option A:	Floor vs swept volume
Option B:	Pressure in cylinder vs swept volume
Option C:	Flow vs speed
Option D:	Pressure vs speed
Q6.	The ratio of the theorotical power that must be deliver to a pump to the actual power delivered to the pump is known as
Option A:	Mechanical efficiency
Option B:	Volumetric efficiency
Option C:	Manometric efficiency
Option D:	Overall efficiency
Q7.	A centrifugal pump delivers water at the rate of 50 litres/s against a total head of 40 metres. Then the power required to drive the pump is
Option A:	2 kW
Option B:	15.2 kW
Option C:	19.6 kW
Option D:	25.8 kW
Q8.	The function of the shaft in pump is to
Option A:	Transmit input power from driver into the impeller
Option B:	Transmit output power driver into the impeller
Option C:	Transmit output power driven into the impeller
Option D:	Transmit Intput power driver into the impeller

Q9.	With the increase in the flow rate, efficiency _____
Option A:	Decreases
Option B:	Increases
Option C:	Remains same
Option D:	Independent
Q10.	In design of Cylinder liner for calculation of thickness of liner is based on which stress? Follow notation As per Design data book for IC Engine Componants by Kale and Khandare
Option A:	Design Strss (Sd)
Option B:	Thermal Stree (St)
Option C:	Maximum Pressure criteria (Sx)
Option D:	Crushing Stress (Sc)
Q11.	Condition 1, D>125mm Condition 2, D<= 125mm Type of liner used for condition 1 and 2 respectivly
Option A:	wet, Dry
Option B:	Dry, Wet
Option C:	selection does not depends on bore dia
Option D:	Wet for both
Q12.	Calculate BSFC in Kg/ Kw. hr if mechanical efficiency is 76% and ISFC 0.2 Kg/Kw.hr
Option A:	0.155
Option B:	0.152
Option C:	0.148
Option D:	0.156

Q13.	The inventor of modern IC engine is
Option A:	Henry Ford
Option B:	Karl Benz
Option C:	Nikolaus Otto
Option D:	Rudolph Diesel
Q14.	Ratio of length of connecting rod to crank radius is usualy
Option A:	1 to 2
Option B:	2 to 3
Option C:	3 to 4
Option D:	4 to 5
Q15.	Conveyor belts are subject to three primary failure mechanisms
Option A:	Yield, Fatigue and Wear
Option B:	Torsion, wear, tension
Option C:	Yeild, fatigue, compressive
Option D:	shear,wear,tension
Q16.	In conveyor belting part breaker is _____.
Option A:	Rubber that resist cutting abrasion & chemical action
Option B:	woven fabric material for tensile strength
Option C:	Fabric coat above carcass to break impact load
Option D:	Rubber layers between carcass plys
Q17.	_____is the supporting device for belt and cargo of belt conveyors on which the belt moves so as to reduce the running resistance of the conveyor.
Option A:	Head pulley
Option B:	Main Pulleys
Option C:	Feed Chutes

Option D:	Idlers
Q18.	In four fall system in EOT crane, relation between velocity of rope on drum and velocity of hook
Option A:	velocity of rope on drum is equal to velocity of hook
Option B:	velocity of rope on drum is twice of velocity of hook
Option C:	velocity of rope on drum is square of velocity of hook
Option D:	velocity of rope on drum is half of velocity of hook
Q19.	Cross section of hook of EOT crane is
Option A:	Circular
Option B:	Rectangular
Option C:	Trapezoidal
Option D:	Square
Q20.	Depth of the crosspiece in EOT crane is found out by considering
Option A:	Tensile stress
Option B:	Compressive stress
Option C:	Bending stress
Option D:	Shear stress
Q21.	In a hook of an EOT crane, in cross section exactly below the centre of curvature, which type of stress is induced?
Option A:	Tensile stress
Option B:	Bending stress
Option C:	Shear stress
Option D:	Compressive stress

Q22.	Find life of bearing in million revolutions for sheave pulley in EOT crane if life in hours is 10000 hrs and N = 6RPM.
Option A:	3.6 mr
Option B:	7.2 mr
Option C:	36 mr
Option D:	72 mr
Q23.	**In the optimum design, the stress equation are the part of _____**
Option A:	**Primary design equation**
Option B:	**Subsidiary design equation**
Option C:	**Limit equation**
Option D:	**Secondary equation**
Q24.	**Blue print of the design of assembly and components includes_____**
Option A:	**Mode of failure**
Option B:	**Tolerances**
Option C:	**Requirement of the products**
Option D:	**Dimensions, Tolerances & Manufacturing methods**
Q25.	**_____ means the actions to be followed while designing**
Option A:	**Morphology**
Option B:	**Methodology**
Option C:	**Preliminary design**
Option D:	**Optimum design**