

Program: BE Mechanical Engineering

Curriculum Scheme: Revised - 2012

Examination: Final Year Semester VIII

Course Code: MEC801 and Course Name: Design of Mechanical Systems

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Q1.	In the optimum design desirable properties should be _____
Option A:	Maximum
Option B:	Minimum
Option C:	Zero
Option D:	Constant
Q2.	The complete engineering description of the tested product is furnished in ____ phase.
Option A:	Planning for distribution
Option B:	Embodiment design
Option C:	Conceptual design
Option D:	Detail design
Q3.	Find out Motor Input Power (Approximate value) If Output Power is 14.66 KW & Transmission Efficiency is 0.85
Option A:	15 Kw
Option B:	18 Kw
Option C:	25 KW
Option D:	30 Kw
Q4.	In a 4-fall Pulley Systems if no of passes are 6. Find No of Bends.
Option A:	5

Option B:	3
Option C:	7
Option D:	4
Q5.	For the hoisting speed is 6 m/min and design load is 144 kN in case of EOT crane, determine the motor capacity taking efficiency of 85%
Option A:	10 kW
Option B:	13.678 kW
Option C:	16.94 kW
Option D:	18.21 kW
Q6.	Steel wires for wire ropes are normally made of
Option A:	Carbon steel with 0.4 to 0.95 c
Option B:	Mild steel
Option C:	Steel with 0.5 to 0.95 c
Option D:	Cast iron
Q7.	What type of Cross Section is Generally Preferred for Hook?
Option A:	Rectangular
Option B:	Trapezoidal
Option C:	Oval
Option D:	Square
Q8.	Which Part in Belt Conveyor having Troughing angle?
Option A:	Roller
Option B:	Hopper
Option C:	Tension Unit
Option D:	Pulley

Q9.	If $T_1 = 1377.9 \text{ kgf}$, Working Tension of Belt/mm width / ply (f)= 0.71 kgf/Ply , Width = 650mm find no approximate of Ply
Option A:	2
Option B:	3
Option C:	7
Option D:	8
Q10.	Find the minimum Tension in the Belt if $P = 714.05 \text{ kgf}$, $\mu = 0.25$, $\alpha = 200^\circ$
Option A:	634.2 kgf
Option B:	461.1 kgf
Option C:	712.1 kgf
Option D:	512.5 kgf
Q11.	The pressure and temperature at the end of compression stroke in a petrol engine are of the order of
Option A:	4 – 6 kg/cm ² and 200 – 250°C
Option B:	6 – 12 kg/cm ² and 250 – 350°C
Option C:	12 – 20 kg/cm ² and 350 – 450°C
Option D:	20 – 30 kg/cm ² and 450 – 500°C
Q12.	For the diesel engine with suction pressure 0.9 bar, if the isentropic process index 1.35 and Compression ratio 14, the maximum pressure inside the cylinder is
Option A:	21.2 bar
Option B:	31.7 bar
Option C:	25.3 bar
Option D:	40.7 bar
Q13.	Find the thickness of dry liner if the diameter of the cylinder bore is 150mm (Use $t = 0.045D + 1.6$)

Option A:	8.35 mm
Option B:	7.24mm
Option C:	6 mm
Option D:	6.18 mm
Q14.	The fuel in diesel engine is normally injected at pressure of
Option A:	5-10 kg/cm ²
Option B:	20-25 kg/cm ²
Option C:	60-80 kg/cm ²
Option D:	90-130 kg/cm ²
Q15.	Scavenging air in diesel engine means
Option A:	Air used for combustion sent under pressure
Option B:	Forced air for cooling cylinder
Option C:	Burnt air containing products of combustion
Option D:	Air used for forcing burnt gases out of engine's cylinder during the exhaust period
Q16.	The torque of the driving shaft is 30 N-m and running at speed of 1500 rpm, the motor capacity required is considering efficiency 80%
Option A:	3.8 kW
Option B:	9.8 kW
Option C:	8.8 kW
Option D:	5.8 kW
Q17.	Compound ray diagram is representation of
Option A:	Minimum number of gear stages and speed steps
Option B:	Large number of spindle speeds
Option C:	Low speed range

Option D:	High speed range
Q18.	What is the maximum percentage loss of economic cutting speed if geometric progression ratio = 1.06?
Option A:	17.0%
Option B:	11.5%
Option C:	5.7%
Option D:	2.9%
Q19.	Kinetic diagram signifies that
Option A:	Number of gears on each shaft
Option B:	Distribution of speed on different gears
Option C:	Distribution of speed on intermediate shafts
Option D:	Distribution of speed on output shaft
Q20.	Which one is not the purpose of using a gear box
Option A:	To increase torque
Option B:	To increase speed
Option C:	Converts single input speed into multiple output speeds
Option D:	To give angular momentum
Q21.	Calculate the power absorbed by the pump if, it has a flow rate of 20 cc/rev and develops a maximum pressure of 70 bar, when electric motor runs at a speed of 1200 rpm.
Option A:	1.9kW
Option B:	2.8kW
Option C:	2.3kW
Option D:	1.7kW

Q22.	Calculate the overall efficiency required for water pumping when $Q = 1200$ LPM and $H = 21$ m. Assume Mechanical Efficiency = 0.90 and Volumetric Efficiency = 0.95 and manometric efficiency = 0.75.
Option A:	6025.26 W
Option B:	6124.26 W
Option C:	6425.26 W
Option D:	6345.26 W
Q23.	Calculate the suction pipe diameter for water pumping when $Q = 1200$ LPM and permitted velocity in the pipe is 2.5 m/s
Option A:	109.10 mm
Option B:	100.90 mm
Option C:	190.10 mm
Option D:	119.10 mm
Q24.	NPSH in a pump refers to
Option A:	Absolute pressure head at inlet to pump to force the liquid into the pump at given temperature
Option B:	Absolute pressure head at outlet of pump to force the liquid into the pump at given temperature
Option C:	Gauge pressure head at inlet to pump to force the liquid into the pump at given temperature
Option D:	Gauge pressure head at outlet of pump to force the liquid into the pump at given temperature
Q25.	Mechanical efficiency of a pump refers to
Option A:	Ratio of power available at impeller to power input to shaft
Option B:	Ratio of power taken from fluid to power input to shaft
Option C:	Ratio of power input to shaft to power given to fluid

Option D:	Ratio of power input to shaft to power input to motor