SHRI SHANKARACHARYA INSTITUTE OF PROFESSIONAL MANAGEMENT AND TECHNOLOGY
DEPARTMENT OF MECHANICAL ENGINEERING

Class Test – I	Session- July-December 2022	Month- November
Sem- 7th	Subject- Design of Transmission System	
Code -	Time Allowed: 2 hrs.	Max Marks: 40

Note: - Note: - Attempt all question. Parts (a) are compulsory of each question. Solve any two parts from (b), (c) and (d) of each question.

Q. No	Questions	Marks	Levels of Bloom's taxonomy	CO
	Unit – I			
1.A	What is gear drive? What are its advantages and disadvantages? Classify the gears.	4	Understanding	CO1
1.B	Design a pair of spur gear to transmit 20 kW power at a pinion speed of 1400 rpm. The transmission ratio is 4. Select suitable material and find out stresses.	8	Creating	CO2
1.C	Design a spur gear to transmit 22 kW at 900 rpm, speed reduction is 2.5. Material for pinion and gear is C15 steel and cast iron G30 respectively. Take pressure angle 20° and working life of gear is 10000 hrs.	8	Understanding	CO1
1.D	Derive the following relation for centre distance of spur gears having involute teeth profile`: For 14.5° pressure angle $$a \geq (i \pm 1)\left\{ \left(\frac{0.85}{[\sigma_c]}\right)^2 \frac{[M_1]\,E}{i\,\psi} \right\}^{\frac{1}{3}}$$ For 20° pressure angle $$a \geq (i \pm 1)\left\{ \left(\frac{0.74}{[\sigma_c]}\right)^2 \frac{[M_t]\,E}{i\,\psi} \right\}^{\frac{1}{3}}$$	8	Analyzing	CO1

	Unit – II			
2.A	Classify the drives. Compare belt and chain drives.	4	Remembering	CO2
2.B	It is required to design a chain drive to connect 5 kW, 1400 rpm electric motor to a drilling machine. The speed reduction is 3 : 1. The centre distance should be approximately 500 mm. (i) Select a proper roller chain for the drive. (ii) Determine the number of chain links. (iii) Specify the correct centre distance between the axes of sprockets.	8	Creating	CO1
2.C	Design a flat belt drive to transmit 30HP at 740 rpm to an aluminium	8	Analyzing	CO3

	rolling machine, the speed ratio being 3. The distance between the pulleys is 3m. Diameter of rolling machine pulley is 1.2m.			
2.D	Design a V-belt drive to the following specifications. Power to be transmitted = 75 kW Speed of driving wheel = 1440 rpm Speed of driven wheel = 400 rpm Diameter of driving wheel = 300 mm Centre distance = 2500 mm Service = 16 hours/day	8	Remembering	CO2

23/11/22 - Shift - I

SHRI SHANKARACHARYA INSTITUTE OF PROFESSIONAL MANAGEMENT AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

Class Test – I	Session- July to Dec. 2022	Month - Nov
Sem- 7th	Subject – MTT	
Code – 337734(37)	Time Allowed: 2 hrs	Max Marks: 40

Note: Que (a) from each question is compulsory of 4marks and solve any two question form (b), (c),(d) each of 8 marks.

Q. No	Questions	Marks	Levels of Bloom's taxonomy
	Unit – I		
A	Explain orthogonal cutting and Oblique cutting.	4	
B	Explain the complete geometry of single point cutting tool with the help of neat sketches?	8	
C	In an orthogonal cutting operation, the following observation were made: cutting speed = 80m/min, cutting force = 20kg, feed force = 8kg ,back rake angle =15 ,feed = 0.2mm/rev ,chip thickness = 0.4mm determine the a) Shear force b) Work done in shear c) Shear strain	8	
D	What are the requirement of cutting tool and derive the velocity relationship involved in metal cutting?	8	
	Unit – II		
A	Explain functions and application of cutting fluid.	4	
B	A Tool life of 80 minutes is obtained at a speed of 30 mpm and 8 minutes at 60 mpm .Determine the following i) Tool life equations ii) Cutting speed for 4 minute tool life.	8	
C	A carbide tool while machining a mild steel work piece was found to have a life of 1 hour and 40 minutes when cutting at 50 meter per minute .Find the tool life if the tool is to operate at speed 30% higher than previous one .also calculate the cutting speed if tool is required to have a life of 2 hour and 45 minutes, Assume Taylor exponent n= 0.28	8	
D	Explain the mechanism of tool wear. Write the differences between face and flank wear?	8	

SHRI SHANKARACHARYA INSTITUTE OF PROFESSIONAL MANAGEMENT AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

Class Test – I	Session- 2022-23	Month- NOV
Sem- 7TH	Subject- AIM	
Code -	Time Allowed: 2Hrs	Max Marks: 40

Note: -

Q. No	Questions	Marks	Levels of Bloom's taxonomy	CO
	Unit – I			
1.A	What is NC part programming?	4	Remembering	CO4
1.B	Explain in detail automated material handling?	8	Remembering	CO2
1.C	What is CNC adaptive control?	8	Remembering	CO5
1.D	Explain rigid automation, programmable automation and flexible automation?	8	Remembering	CO3

Q. No	Questions	Marks	Levels of Bloom's taxonomy	CO
	Unit – II			
2.A	What are the various hardware requirements for CAD software and what is the need and the principles of computer graphics?	4	Remembering	CO2
2.B	Explain the comparison of Database and Traditional File Systems	8	Remembering	CO3
2.C	Explain in detail fundamentals of CAD?	8	Remembering	CO1
2.D	What is geometric modelling?	8	Remembering	CO4

SRI SHANKARACHARYA INSTITUTE OF PROFESSIONAL MANAGEMENT AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

Class Test – I	Session- 2022- 2023	Month- November
Sem- 7	Subject- Technology Management	
Code - 300883(36)	Time Allowed: 2 Hrs	Max Marks: 40

Note: - 1) Part 'A' is compulsory in both questions
2) Attempt any two questions from parts 'B', 'C', and 'D'

Q. No	Questions	Marks	Levels of Bloom's taxonomy	CO
Unit – I				
1. A	Define technology management	4	R	CO 1
1. B	Why it is essential to manage the technology? how the management of technology can be done in the automobile industry?	8	U	CO 1
1. C	What are the different criteria for technology classification?	8	R	CO 1
1. D	Do you agree that technology developments in India have not been very encouraging while achievements in science have been remarkable? If so, list the Reasons. Suggest some ways to improve the situation.	8	A	CO 1

Q. No	Questions	Marks	Levels of Bloom's taxonomy	CO
Unit – II				
2.A	With an example bring out the differences between the radical and incremental innovation	4	U	CO 2
2.B	Differentiate between innovation and invention. Give one example of each.	8	U	CO 2
2.C	Discuss the advantages and disadvantages of the market leader. What are the main challenges of the market leader industry? Explain with suitable examples.	8	U	CO 2
2.D	Discuss the innovation cycle and its stages in detail with a suitable example	8	U	CO 2

Class Test – I	Session- July-December, 2022	Month- November, 2022
Sem- 7th	Subject- RAC	
Subject Code – 3037712(037)	Time Allowed: 2hr.	Max Marks: 40

Note: - 1.first Question (A) from both unit are compulsory.
2. Solve any two from B, C, D of each unit.

Q. No	Questions	Marks	Levels of Bloom's taxonomy	CO
	Unit – I			
1.A	Define terms Refrigerator and Heat Pump	4	R	1
1.B	With the help of neat diagram explain how actual VCR cycle differs with ideal one.	8	U	1
1.C	A vapour compression refrigeration machine, with Freon-12 as a refrigerant, has a capacity of 12 tonne of refrigeration operating between a -28⁰C and 26⁰C. The refrigerant is subcooled by 4⁰C before entering the expansion valve and the vapour is superheated by 5⁰C before leaving the evaporator. The machine has a six-cylinder single-acting compressor with stroke equal to 1.25 times the bore. It has a clearance of 3% of the stroke volume, determine:1. Theoretical power required; 2. C.O.P.; 3. Volumetric efficiency; 4. Bore and stroke of cylinder. The speed of compressor is 1000 r.p.m. The following properties of Freon-12 may be used.	8	Ap	1

Sat.temp ⁰C	Pressure, bar	Sp.Volume of vapor m³/kg	Enthalpy, KJ/Kg		Entropy, KJ/Kg K	
			Liquid	Vapor	Liquid	Vapor
-28	1.093	0.1475	10.64	175.11	0.0444	0.7153
26	6.697	0.0262	60.67	198.11	0.2271	0.6865

Specific heat of liquid refrigerant =0.963KJ/Kg K and specific heat of superheated vapour =0.615KJ/Kg K.

Q. No	Questions	Marks	Levels of Bloom's taxonomy	CO
1.D	A cold storage plant is required to store 20 tonnes of fish. The fish is supplied at a temperature of 30⁰C. the specific heat of fish above freezing point is 2.93 KJ/Kg K. The specific heat of fish below freezing point is 1.26 KJ/Kg K. the fish is stored in cold storage which is maintained at - 8⁰C. The freezing point of fish is - 4⁰C. The latent heat of fish is 235 KJ/Kg K. if the plant requires 75 KW to drive it, find: 1. The capacity of plant, and 2. Time taken to achieve cooling. Assume actual C.O.P. of the plant as 0.3 of the Carnot C.O.P.	8	Ap	1

	Unit – II			
2.A	Explain the Properties of an Ideal Refrigerant.	4	R	3
2.B	Explain the Principle and Working of Domestic Electrolux Refrigerator.	8	R	3
2.C	Derive an expression for COP of a Vapour absorption Refrigeration system in terms of Generator Temperature, Condenser temperature and Evaporator temperature.	8	U	3

2.D	Write Short Notes on:
	   (a) Hermitically Sealed compressor.
	   (b) Capillary Tube.
		8	U	3

25/11/2022

Shift-I

Class Test – I	Session- July-December 2022	Month- November
Sem- 7ᵗʰ	Subject- Design of Transmission System	
Code -	Time Allowed: 2 hrs.	Max Marks: 40

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	Unit – II			
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2.B	It is required to design a chain drive to connect 5 kW, 1400 rpm electric motor to a drilling machine. The speed reduction is 3 : 1. The centre distance should be approximately 500 mm. (i) Select a proper roller chain for the drive. (ii) Determine the number of chain links. (iii) Specify the correct centre distance between the axes of sprockets.	8	Creating	CO1
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	rolling machine, the speed ratio being 3. The distance between the pulleys is 3m. Diameter of rolling machine pulley is 1.2m.			
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