

SHRI SHANKARACHARYA INSTITUTE OF PROFESSIONAL MANAGEMENT AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

Class Test – II

Session- July to Dec. 2021

Month - Dec

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	CO
Unit – II				
A	Define machinability index. State the factor which come into play while evaluating machinability of any material.	4	A	CO5
B	What is the effect of various parameters on tool life? Derive Taylor's tool life relationship involving cutting parameters.	8	U,A	CO6
C	Explain the mechanism of tool wear. Write the differences between face and flank wear?	8	C	CO6
D	A tool life of 80 minute is obtained at a speed of 30 mpm and 8 minute at 60 m.p.m determine the following i)Tool life equation ii)Cutting speed for 4 minute tool life	8	U	CO6
Unit – IV				
A	Explain the following – I) Ray Diagram II) Structure Diagram	4	U	CO8
B	A machine spindle is to operate on ferrous metal at 30m/min and is required to have 6 speeds. The spindle can accommodate H.S.S .cutter ranging from 10 to 60 mm diameter. Determine the following : i)Spindle speeds ii)Plot a graph between cutting velocity and	8	C	CO7

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	cutter diameter for each spindle speed and calculate the range of cutting velocity for: i) 12mm diameter ii) 36 mm diameter cutter.			
C	A 4 Speed (4×1) gear box is required to be designed with speed ranging from 45 rpm with $\phi = 1.25$.Determine the number of teeth of gears.	8	U,C	CO7
D	A machine tool spindle is to have six speed and is to run at a maximum speed of 786 R.P.M and a minimum speed of 24 R.P.M. Calculation the spindle speeds.	8	U	CO8

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DEPARTMENT OF MECHANICAL ENGINEERING

Class Test – II	Session- 2020-21	Month- December
Sem- 7 th	Subject- PDD	
Code – 337744(37)	Time Allowed: 2hr.	Max Marks: 40

Note: - Question 1 A and 2 A are Compulsory and solve any two from B,C,D from each section.

Q. No	Questions	Marks	Levels of Bloom's taxonomy	CO
Unit – I				
1.A	Define DFM?	4	R	4
1.B	Explain prototype on the basis of : (i) Principle (ii)Types (iii)Purpose	8	R	5
1.C	Explain in detail Different levels of Manufacturing cost analysis / estimation?	8	U	1
1.D	What are the steps involved in DFM process?	8	U	2

Unit – II				
2.A	What do you mean by Industrial Design Process?	4	R	4
2.B	Explain the steps involved in Industrial design process?	8	U	1
2.C	What is the Need of Management of Technology and how is it done?	8	R	7
2.D	Explain how the quality of Industrial Design is accessed ?	8	U	2

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DEPARTMENT OF MECHANICAL ENGINEERING

Class Test – II	Session- 2021-22	Month- DEC
Sem- 7	Subject- Auto	
Code - 337731(37)	Time Allowed: 2 hrs	Max Marks: 40

Note: -
Part A of questions Unit III and Unit IV is compulsory, from other parts B, C and D, attempt any two parts.

Q. No	Questions	Marks	Levels of Bloom's taxonomy	CO
Unit – III				
1.A	Draw the neat sketch of a sliding mesh gear box and explain in brief.	4	Remembering	CO3
1.B	Draw the neat sketch of a synchromesh gear box & discuss the construction, working and merits of the same.	8	Remembering	CO3
1.C	With the help of neat sketches explain the construction, working of torque converter. Draw the performance characteristic of three stage torque converter and explain.	8	Remembering	CO3
1.D	What is epicyclic gear box? Describe its principle with neat sketch.	8	Remembering	CO4

Unit – IV

2.A	Distinguish between Master cylinder and Tandem master cylinder	4	Remembering	CO4
2.B	What is the necessity of differential in an automobile? Explain one type of differential with the help of neat sketch.	8	Remembering	CO5
2.C	What are the reasons for excessive type wear? Write brief notes on the construction of tyre. Explain tubeless tyre with a neat diagram	8	Remembering	CO5
2.D	Explain how does Hotchkiss drive differs from torque tube drive with the help of neat sketches.	8	Remembering	CO5

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DEPARTMENT OF MECHANICAL ENGINEERING				
Class Test – II		Session- July to Dec. 2021	Month - December	
Sem- 7 th		Subject – CAD/CAM		
Code –337733(37)		Time Allowed: 2 hrs	Max Marks: 40	
Note: Attempt any 5 questions. All question carry equal marks.				
Q. No	Questions	Marks	Levels of Bloom's taxonomy	CO
Unit – III				
A	What is Euler's law? Check the validity of Euler's law on a (a) Cylinder (b) Cone	8	U	CO 5
Unit – IV				
B	Consider a Rectangular MS block of dimension 10 cm x 10 cm. use MACRO statement to drill holes at the centre of the 4 Quadrants. Take Radius of holes as 0.5 mm.	8	U	CO 7
C	What is the difference between Generative & Retrieval types of process planning? Explain taking a suitable example.	8	R	CO 8
D	Is it a valid statement that direct numerical control is more beneficial & useful than computer numerical control? Support your answer with valid reasons.	8	R	CO 6
Unit – V				
A	What is group technology? Explain it's benefits & Limitations.	8	R	CO 8
B	Explain basic, system and aggregate, flexibility, in context of fms.	8	R	CO 8

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DEPARTMENT OF MECHANICAL ENGINEERING

Class Test – II

Session- July-December, 2021

Month- December, 2021

Sem- 7th

Subject- RAC

Code –337732(37)

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 the sensible Heating and Sensible cooling with Graph.	4	R	6
1.B	The saturated air leaving the cooling section of an air conditioning system at 14°C at the rate of 50 m ³ /min is mixed adiabatically with the outside air at 32°C and 60% relative humidity at a rate of 20 $\frac{m^3}{min}$. If the mixing process occurs at a pressure of 1 atmosphere, determine the specific humidity, relative humidity, dry bulb temperature and the volume flow rate of the mixture.	8	U	6
1.C	The atmospheric air at 30° C dry bulb temperature and 75% relative humidity enters a cooling coil at the rate of 200 $\frac{m^3}{min}$. The coil dew point temperature is 14°C, and the by-pass factor of the coil is 0.1. Determine: 1. the temperature of air leaving the cooling coil; 2. the capacity of the cooling coil in tonnes of refrigeration and in kilowatt; 3. the amount of water vapor removed per minute; and 4. the sensible heat factor	8	Ap	6
1.D	What is effective Temperature? List the factor for optimum effective temperature.	8	Ap	6

Unit – II

2.A	Define RSHF, GSHF and ERSHF.	4	R	7
2.B	An air conditioning system is to be designed for a restaurant with the following data: Outside design conditions = 40°C DBT, 28°C WBT Inside Design conditions = 25°C DBT, 50% RH Solar heat gain through walls, roof, and floor =5.87 kW Solar heat gain through glass= 5.52kW Occupants= 25 Sensible heat gain per person= 58 W	16	Ap	7

	<p>Latent heat gain per person= 58 W</p> <p>Sensible heat gain from another sources= 11.63 kW</p> <p>Internal lighting load = 15 lamps of 100 W, 10 fluorescent tubes of 80 W.</p> <p>Infiltrated air = $15 \frac{m^3}{min}$</p> <p>If 25% fresh air and 75% recirculated air is mixed and passed through the conditioner coil, find:</p> <p>(a) The amount of total air required in $\frac{m^3}{h}$;</p> <p>(b) The dew point temperature of the coil.</p> <p>(c) The condition of supply air to the room; and</p> <p>(d) The capacity of the conditioning plant.</p> <p>Assume the by-pass factor equal to 0.2.</p> <p>Draw the schematic diagram of the system and show the system on skeleton psychrometric chart and insert the temperature and enthalpy values at salient points.</p>			
2.C	<p>The following data refer to summer air conditioning of a building:</p> <p>Outside design conditions=43°C DBT, 27°C WBT</p> <p>Inside design conditions= 25°C DBT, 50% RH</p> <p>Room sensible heat gain= 84 000 kJ/h</p> <p>Room latent heat gain= 21 000 kJ/h</p> <p>By-pass factor of the cooling coil = 0.2</p> <p>The return air from the room is mixed with the outside air before entry to cooling coil in the ratio of 4: 1 by mass. Determine:</p> <p>(a) Apparatus dew point of the cooling coil.</p> <p>(b) Entry and exit conditions of air for cooling coil.</p> <p>(c) Fresh air mass flow rate; and</p> <p>(d) Refrigeration load on the cooling coil.</p>	16	Ap	7