V.S.B. ENGINEERING COLLEGE, KARUR

Department of Mechanical Engineering

Academic Year: 2018-2019 (ODD Semester)

Assignment Questions

Subject Code & Name **:** ME 6501 & Computer Aided Design

SL. NO	ASSIGNMENT DETAILS
1.	Write a case study on parametric modeling and design.
2.	Explain the basic features available in CAD/CAM system with illustrations.
3.	What is under defined, fully defined and over defined sketching? Explain your answers with sketches?
4.	Explain in detail about the layers in CAD/CAM system. Also give some example where layering concept is useful.
5.	Explain about grids in a CAD system. Also give some example where grid concept is useful.
6.	What is Product Lifecycle Management (PLM)? Write a case study on implementing PLM.
7.	Explain the BIS conventions used for dimensioning a drawing.
8.	Explain about various geometrical constraints used in sketching.
9.	What do you mean by feature in CAD? Explain about feature manipulation.
10.	Explain about the set of features available in AutoDesk inventor.
11.	Explain about the set of features available in SolidWorks.
12.	Explain about the set of features available in CATIA.
13.	Explain the working of Raster displays.
14.	Write a case study on Assembly modeling.
15.	Describe and sketch the various available dimensioning schemes.
16.	Describe the basic rules that ANSI requires in dimensioning any drawing.
17.	Give a list of ANSI symbols for geometric tolerance and explain them with examples.
18.	Illustrate how to specify various size and location tolerances with ANSI symbols.
19.	Give a list of ANSI symbols for form tolerance and explain them with examples.
20.	Describe about tolerance practices in manufacturing.
21.	Describe about tolerance modeling.
22.	Explain about the various assembly constraints available in AutoDesk inventor.
23.	Explain about the various assembly constraints available in SolidWorks.
24.	Explain about the various assembly constraints available in CATIA.
25.	Investigate the shading, lighting, shadows, texture and transperencies offered by any CAD system that you are master with.
26.	Compare and contrast the features available in any two popular CAD systems.
27.	Explain Datum Features.
28.	Briefly explain the requirements for a graphic database.
29.	Explain the functioning of Liquid Crystal Display terminals as used in CAD.
30.	Explain the importance of engineering analysis process in the product design cycle.
31.	Explain with an example various steps in the modern design process.
32.	Write a case study on Rapid Prototyping and how CAD is useful in that.
33.	Write a case study on Design for assembly.

SL. NO	ASSIGNMENT DETAILS
34.	Explain about the various views available in CAD systems and explain how it is useful.
35.	Explain about Three-dimensional sketching.
36.	Write a case study on how to create a model assembly with any CAD system.
37.	Describe collaborative design and write a case study on it.
38.	Illustrate the types of views that can be used in a drawing.
39.	Describe about sketching plane and describe the methods to specify an sketching plane in any CAD system.
40.	Explain about Exploded view and how to create it with the help of any CAD system.
41.	Write about Design for Manufacturing.
42.	Write about Design for Environments.
43.	Discuss in detail how to generate production and assembly drawing using any CAD system.
44.	Write about automated drafting.
45.	Explain about Mechanism simulation.
46.	Discuss about various mating constraints with examples
47.	Compare and contrast the mating constraints available in two different CAD systems.
48.	Discuss about the rendering options available in any CAD system.
49.	Explain about the input devices more commonly employed for graphics applications.
50.	What is screen buffer? Explain with example.
51.	What is Product Data Management (PDM)? Write a case study on implementing PDM.
52.	Sketch a simple screw jack assembly, label the parts and generate the assembly tree for that.
53.	Sketch a simple pressure relief valve assembly, label the parts and generate the assembly tree for that.
54.	Sketch a simple plummer block assembly, label the parts and generate the assembly tree for that.
55.	Sketch a simple universal joint assembly, label the parts and generate the assembly tree for that.
56.	Compare IGES and STEP.

V.S.B. ENGINEERING COLLEGE, KARUR

Department of Mechanical Engineering

Academic Year: 2018-2019 (ODD Semester)

Assignment Details

Class: III Year/ V Semester Mechanical Engineering "A" Section

Subject Name/Code: Design of Machine Elements/ ME 6503

Faculty name: D.Sivakumar

Sl.No.	Register No.	Name of the Student	Topic Details
1.	922516114001	Aakash S	Explain the design process and factor influencing machine design.
2.	922516114002	Abilash V	Justify the Selection of materials based on mechan properties of machine design.
3.	922516114003	Ajith R	Explain Preferred numbers, Fits and Tolerances
4.	922516114004	Ajith S	Justify the Direct,Bending and Torsional st equations.
5.	922516114005	Ajith Kumar S	Explain about Impact and shock loading, eccentric loading.
6.	922516114006	Akash P	Calculation of principle stresses for various load combinations?
7.	922516114007	Alex Pandiyan S	Design of curved beams – crane hook and 'C' frame
8.	922516114008	Allen Vijay V.N	Explain the Factor of safety based on theories of failure,
9.	922516114009	Alwin Geo Johnson	Design based on strength and stiffness of machine component
10.	922516114010	Arasavil Clinton T	Design for variable loading in stress concentration
11.	922516114011	Aravinth Madhu P	Design of solid and hollow shafts based on strength and rigidity
12.	922516114012	Arulkumar R	Design of solid shaft and hollow shaft based on

			Critical speed
13.	922516114014	Balasubramani K	Design of keys, key ways & splines
14.	922516114015	Balasubramani M	Design of rigid and flexible couplings
15.	922516114016	Bhuvaneswaran T	Explain about the Threaded fasteners
16.	922516114017	Charan Kumar P	Design of bolted joints including eccentric loading
17.	922516114019	Deepak G	Establish a formula for the frictional torque transmitted by a cone clutch.
18.	922516114021	Dharaniraj K	Design of cotter joints
19.	922516114022	Dhivakaran C	Design of welded joints, riveted joints for structures
20.	922516114023	Elangovan M	Explain in detail about theory of bonded joints
21.	922516114024	Elson Kurian Ezekiel	Discuss in the various types of springs and optimization of helical springs
22.	922516114025	Eswaramoorthi K	Design of rubber springs
23.	922516114033	Gowtham R	Design of flywheels considering stresses in rims and arms, for engines and punching machines.
24.	922516114034	Gowtham T	Problems on Connecting Rods and crank shafts
25.	922516114035	Gowthaman P	Design of Sliding contact bearings
26.	922516114036	Gowthamkumar S	Design of rolling contact bearings
27.	922516114037	Gugan S	Design of Hydrodynamic journal bearings,
28.	922516114038	Guna K.V	Justify about the selection of Rolling Contact bearings
29.	922516114039	Hanish R	Explain with the mathematical expressions of Maximum principal stress theory and Von-Mises-Henky theory
30.	922516114040	Hariesh P.K	Explain with the mathematical expressions of Maximum shear theory and Venant's theory
31.	922516114042	Hariharan R	Prove that in a spring, using two concentric coil springs made of same material, having same length and compressed equally by an axial load, the loads shared by the two springs are directly proportional to the square of the

			diameters of the wires of the two springs.
32.	922516114043	Hari Prasath M	Describe, with the help of neat sketches, the types of various shaft couplings mentioning the uses of each type.
33.	922516114044	Harshavarthan A M	Explain the utility of the centre bolt, U-clamp, rebound clip and camber in a leaf spring.
34.	922516114045	Jagadeesh M	What is nipping in a leaf spring? Discuss its role. List the materials commonly used for the manufacture of the leaf springs.
35.	922516114046	Jaswanth P	Explain what you understand by A.M. Wahl's factor and state its importance in the design of helical springs?
36.	922516114047	Joel E	Discuss the function of a coupling. Give at least three practical applications.
37.	922516114048	Joselin Mano J	What is meant by hole basis system and shaft basis system? Which one is preferred and why?
38.	922516114049	Kalaiyarasan G	What is factor of safety? List the factors to be considered while deciding the factor of safety
39.	922516114050	Kaliraj K	Explain in short the stress concentration factor and methods of relieving stress concentrations
40.	922516114051	Kamesh V	What is the difference between Gerber curve and soderberg and Goodman lines
41.	922516114052	Kanthavel Raj S	A rigid type of coupling is used to connect two shafts transmitting 15 kW at 200 rpm. The shaft, keys and bolts are made of C45 steel and the coupling is of cast iron. Design the coupling.
42.	922516114054	Karthikeyan P	Design a protective type flange coupling to connect two shafts to transmit 15 kW at 600rpm.
43.	922516114301	Arun Kumar M	What is an eccentric loaded welded joint?

			Describe procedure for designing such a joint.
44.	922516114302	Christobher Raja A	What are the considerations in the design of dimensions of formed and parallel key having rectangular cross-section ?
45.	922516114304	Mukesh K	Explain the term Dynamic load carrying capacities of rolling contact bearing.
46.	922516114305	Muppudathi Muthu I	What is the effect of change in spring index on Wahl's factor and on the stress induced in a helical compression spring?
47.	922516114307	Naveen Kumar V	In hydrodynamic bearing, what are factors which influence the formation of wedge fluid film?
48.	922516114308	Pon Aravinthan	What is the effect of change in spring index on Wahl's factor and on the stress induced in a helical compression spring?
49.	922516114309	Siva Sandeep D	Calculate the tolerances, fundamental deviations and limits of sizes for the shaft designated as 40 H8 / f7.
50.	922516114033	Gowtham R	State briefly unilateral system of tolerances covering the points of definition, application and advantages over the bilateral system.
51.	922516114034	Gowtham T	What do you understand by cold working of metals? Describe briefly the various cold working processes.
52.	922516114035	Gowthaman P	Write the relations used for maximum stress when a machine member is subjected to tensile or compressive stresses along with shearing stresses.
53.	922516114036	Gowthamkumar S	Prove the relation: $M/I = \sigma/y = E/R$
54.	922516114037	Gugan S	A rectangular plate 50 mm × 10 mm with a hole

			10 mm diameter is subjected to an axial load of 10 kN.Taking stress concentration into account, find the maximum stress induced.
55.	922516114038	Guna K.V	Illustrate how the stress concentration in a component can be reduced.

Signature of faculty **HOD**

V.S.B. ENGINEERING COLLEGE, KARUR

Department of Mechanical Engineering

Academic Year: 2018-2019 (ODD Semester)

Assignment Details

	Topic Details
56.	Explain dynamic force analysis of a 4 link mechanism
57.	Explain Dynamic Equivalence.
58.	Explain dynamic force analysis of a slider crank mechanism.
59.	What is engine force analysis?
60.	Determine of force & couple of a link.
61.	Explain general principal of force analysis.
62.	Explain slider crank mechanism with figure.
63.	Explain four link mechanism with figure.
64.	Explain the different parts of Dynamics of Machinery.
65.	Explain the degrees of freedom with sketch.
66.	Define equilibrium with respect to two force members and three force members.
67.	State the conditions for static equilibrium of a body, subjected to a system of i) two forces ii) three forces.
68.	Give significance of static force analysis of mechanisms.
69.	Explain the procedure for static force analysis of slider-crank mechanism
70.	Explain principle of virtual work application to static force analysis

71.	Explain the procedure for static force analysis of four bar mechanism.
72.	Derive an expression for 'size of fly wheel'.
73.	What is the function of a flywheel? How does it differ from that of a governor? Explain it.
74.	Explain the concept of balancing in bikes.
75.	Explain Methods for Determining the Velocity of a Point on a Link
76.	Explain Method of Locating Instantaneous Centres in a Mechanism
77.	What do you understand by the instantaneous centre of rotation (centro) in kinematic ofmachines? Answer briefly.
78.	Explain the concept of balancing in four wheelers.
79.	Explain, with the help of a neat sketch, the space centrode and body centrode.
80.	Explain with sketch the instantaneous centre method for determination of velocities of links and mechanisms.
81.	Write the relation between the number of instantaneous centres and the number of links in a mechanism.
82.	Discuss the three types of instantaneous centres for a mechanism.
83.	State and prove the 'Aronhold Kennedy's Theorem' of three instantaneous centres.
84.	Describe the method to find the velocity of a point on a link whose direction (or path) is known and the velocity of some other point on the same link in magnitude and direction is given.
85.	Explain how the velocities of a slider and the connecting rod are obtained in a slider crank mechanism.
86.	Define rubbing velocity at a pin joint. What will be the rubbing velocity at pin joint when the two links move in the same and opposite directions ?
87.	What is the difference between ideal mechanical advantage and actual mechanical advantage ?
88.	plain how the acceleration of a point on a link (whose direction is known) is obtained when the acceleration of some other point on the same link is given in magnitude and direction.
89.	Draw the acceleration diagram of a slider crank mechanism.
90.	Explain how the coriolis component of acceleration arises when a point is rotating about some other fixed point and at the same time its distance from the fixed point varies.
91.	Derive an expression for the magnitude and direction of coriolis component of acceleration.
92.	Sketch a quick return motion of the crank and slotted lever type and explain the procedure of drawing the velocity and acceleration diagram, for any given configuration of the mechanism.

93.	Write a short note on gyroscope.
94.	What do you understand by gyroscopic couple ? Derive a formula for its magnitude.
95.	Explain the application of gyroscopic principles to aircrafts.
96.	Describe the gyroscopic effect on sea going vessels.
97.	Explain the effect of the gyroscopic couple on the reaction of the four wheels of a vehicle negotiating a curve.
98.	Discuss the effect of the gyroscopic couple on a two wheeled vehicle when taking a turn.
99.	What will be the effect of the gyroscopic couple on a disc fixed at a certain angle to a rotating shaft ?
100.	Draw and explain Klien's construction for determining the velocity and acceleration of the piston in a slider crank mechanism.
101.	Explain Ritterhaus's and Bennett's constructions for determining the acceleration of the piston of a reciprocating engine.
102.	How are velocity and acceleration of the slider of a single slider crank chain determined analytically?
103.	Draw the turning moment diagram of a single cylinder double acting steam engine.
104.	Explain the turning moment diagram of a four stroke cycle internal combustion engine.
105.	Discuss the turning moment diagram of a multicylinder engine.
106.	What are the effects of friction and of adding a central weight to the sleeve of a Watt governor ?
107.	Why is balancing of rotating parts necessary for high speed engines ?
108.	Discuss inertia effect on the shaft on the free torsional vibrations.

Signature of faculty **HOD**

V.S.B. ENGINEERING COLLEGE, KARUR

DEPARTMENT OF MECHANICAL ENGINEERING

ASSIGNMENT QUESTION

CLASS / SECTION : III YEAR C Section

S	REG. NO	NAME OF THE STUDENTS	ASSIGNMENT DETAILS
1.	922516114108	RAJESH S	cold storage room has walls made of 23 cm of brick on the outside, 8 cm of plastic foam and finally 1.5 cm of wood on the inside. The outside and inside air temperatures are 22°C and –2°C respectively. The inside and outside heat transfer coefficients are respectively 29 and 12 W/m^2.K. The thermal conductivities of brick, foam and wood are 0.98, 0.02 and 0.12 W/m.K respectively. If the total wall area is 90 m^2, determine the rate of heat removal by refrigeration and the temperature of the inside surface of the brick.
2.	922516114109	RAJ GOWTHAM S	A 6 – m long section of an 8 cm diameter horizontal hot water pipe passes through a large room in which the air and walls are at 20°C. The pipe surface is at 70°C and the emissivity of the pipe surface is 0.7. Find the rate of heat loss from the pipe by natural convection and radiation.
3.	922516114110	RAKESH M	Hot gases enter a finned tube, cross flow heat exchanger with a flow rate of 1.5 kg/s and a temperature of 250°C. The gases are used to heat water entering the exchanger at a flow rate of 1 kg/s and an inlet temperature of 35°C. On the gas side, the overall heat transfer coefficient and the area are 100 W/m^2.K and 40 m^2 respectively. What is the rate of heat transfer by the exchanger and what are the gas and water exit temperatures? Assume C_p of gas as 1.0 kJ/kg.K.
4.	922516114111	RAMACHANDRAN S	Consider a cylindrical furnace with outer radius = height = 1 m. The top (surface 1) and the base (surface 2) of the furnace have emissivities 0.8 & 0.4 and are maintained at uniform temperatures of 700 K and 500 K respectively. The side surface closely approximates a black body and is maintained at a temperature of 400 K. Find the net rate of radiation heat transfer at each surface during steady state operation. Assume the view factor from the base to the top surface as 0.38.

S	REG. NO	NAME OF THE STUDENTS	ASSIGNMENT DETAILS
5.	922516114112	RAMAKRISHNAN M	Two very large parallel planes exchange heat by radiation. The emissivities of the planes are respectively 0.8 and 0.3. To minimize the radiation exchange between the planes, a polished aluminium radiation shield is placed between them. If the emissivity of the shield is 0.04 on both sides, find the percentage reduction in heat transfer rate.
6.	922516114113	RAMKUMAR P	Air at 1.01 bar and 30°C flows past a tray full of water with a velocity of 2 m/s. The partial pressure of water vapour is 0.7 kPa and the saturation pressure is 3.17 kPa. The tray measures 40 cm along the flow direction and has a width of 20 cm. Calculate the vaporation rate of water if the temperature on the water surface is 25°C. Assume the following properties for air: density, ρ 1.2 kg/m^3, kinematic viscosity, ν = 15 × 10^{-6} m^2/s and diffusivity, D = 0.145 m^2/h.
7.	922516114114	RAMPRAKASH S	A steel rod of diameter 12 mm and 60 mm long with an insulated end that has a thermal conductivity of 32 W/(m.°C) is to be used as a spine. It is exposed to surroundings with a temperature of 60°C and a heat transfer coefficient of 55 W/(m^2.°C). The temperature at the base of the fin is 95°C. Calculate the fin efficiency, the temperature at the edge of the spine and the heat dissipation.
8.	922516114115	RANJITH M.R	60 mm thick large steel plate [k = 42.6 W/m.°C), α = 0.043 m^2/h] initially at 440°C is suddenly exposed on both sides to an ambient with convective heat transfer coefficient 235 W/(m^2.°C) and temperature 50°C. Determine the centre line temperature and the temperature inside the plate 15 mm from the mid plane after 3 minutes.

S	REG. NO	NAME OF THE STUDENTS	ASSIGNMENT DETAILS
9.	922516114116	REVANTH K	Air is flowing over a flat plate 5 m long and 2.5 m wide with a velocity of 4 m/s at 15°C. If $\rho = 1.208$ kg/m^3 and $\upsilon = 1.47 \times 10^{-5}$ m^2/s, calculate the length of plate over which the boundary layer is laminar and thickness of the boundary layer (laminar), shear stress at the location where boundary layer ceases to be laminar and the total drag force on the both sides on that portion of the plate where boundary layer is laminar.
10.	922516114117	SACHITHANANTHAM K	The flow rates of hot and cold water streams running through a parallel flow heat exchanger are 0.2 kg/s and 0.5 kg/s respectively. The inlet temperatures on the hot and cold sides are 75°C and 25°C respectively. The exit temperature of hot water is 45°C. If the individual heat transfer coefficients on both sides are 650 W/m°C, calculate the area of the heat exchanger.
11.	922516114118	SAKTHIVEL V.S	lculate the following for an industrial furnace in the form of a black body and emitting radiation at 2500 °C ☹1) Monochromatic emissive power at 1.2 μ m length (2) Wavelength at which the emission is maximum (3) Maximum emissive power (4) Total emissive power (5) Total emissive power of the furnace if it is assumed as a real surface with emissivity is equal to 0.7
12.	922516114119	SANTHANA KARUPPAIAH M	Calculate the net radiant heat exchange per m^2 area for two large parallel plates at temperatures of 427°C and 27°C respectively. The emissivity of hot and cold plate is 0.9 and 0.6 respectively. If a polished aluminum shield is placed between them, find the percentage reduction in the heat transfer. The emissivity of shield is 0.4.
13.	922516114120	SANTHOSH P	The radiation shape factor of the circular surface of a thin hollow cylinder of 10 cm diameter and 10 cm length is 0.1716. What is the shape factor of the curved surface of the cylinder with respect to itself?
14.	922516114121	SARAN K	A vessel contains binary mixture of O_2 and N_2 with partial pressures in the ratio 0.21 and 0.79 at 15°C. The total pressure of the mixture is 1.1 bar. Calculate the following : (1) Molar concentrations, (2) Mass densities,(3) Mass fractions and (4) Molar fractions of each species.

S	REG. NO	NAME OF THE STUDENTS	ASSIGNMENT DETAILS
15.	922516114122	SARAN KUMAR A	composite wall consists of 2.5 cm thick Copper plate, a 3.2 cm layer of asbestos insulation and a 5 cm layer fibre plate. Thermal conductivities of the materials are respectively 355, 0.110 and 0.0489 W/m.K. The temperature difference across the composite wall is 560°C (560°C on one side and 0°C on the other side. Find the heat flow through the wall per unit area and the interface temperature between asbestos and fiber plate.
16.	922516114123	SARATH KUMAR R	Air at 20°C at 3m/s flows over a thin plate of 2m long and 1m wide. Estimate the boundary layer thickness at the trailing edge, total drag force, mass flow of air between x □ 30cm and x □ 80cm . Take v □ 15 □ 10 and ρ □ 1.17kg/m^3 .
17.	922516114124	SARAVANAN G	Two large parallel plates of 1m×1m spaced 0.5m apart in a very large room whose walls are at 27°C. The plates are at 900°C and 400°C with emissivities 0.2 and 0.5 respectively. Find the net heat transfer to each plate and to the room.
18.	922516114125	SARAVANAN M	The temperature recorded by a thermometer whose bulb covered by a wet wick in dry air at atmospheric pressure is 22°C. Estimate the true air temperature.
19.	922516114126	SASIKUMAR K	Dry air at 27°C and 1 bar flows over a wet plate of 50cm at 50m/s. Calculate the mass transfer coefficient of water vapour in air at the end of the plate.
20.	922516114127	SASIKUMAR P	Assuming the sun to be a black body emitting radiation with maximum intensity at λ=0.49μm, calculate (i) the surface temperature of the sun, (ii) the heat flux at surface of the sun.
21.	922516114129	SATHEESHKUMAR P	Calculate the following for an industrial furnace in the form of a black body and emitting radiation at 2500 ºC. (i) Monochromatic emissive power at 1.2 μm length, (ii) Wavelength at which emission is maximum, (iii) Maximum emissive power, (iv) Total emissive power & (v) Total emissive power of the furnace if it is assumed as a real surface with emissivity equal to 0.9.

S	REG. NO	NAME OF THE STUDENTS	ASSIGNMENT DETAILS
22.	922516114130	SATHISH KUMAR S	A 70 mm thick metal plate with a circular hole of 35 mm diameter along the thickness is maintained at a uniform temperature 250 ºC. Find the loss of energy to the surroundings at 27 ºC; assuming the two ends of the hole to be as parallel discs and the metallic surfaces as shown in the fig. given below and surroundings have black body characteristics.
23.	922516114131	SEENIVASAN G	Derive an expression of heat transfer between two non black bodies having infinite parallel planes.
24.	922516114132	SEENIVASAN N	A refractory material which has emissivity as 0.4 at 1500 K and emissivity at 1420 K is exposed to black furnace walls at 1500 K. What is the rate of gain of heat radiation per m^2 area?
25.	922516114133	SELVA PRAKASH P	Calculate the net radiant heat exchange per m^2 area for two large parallel plates at temperatures of 427 ºC and 27 ºC respectively. Take ε (hot plate) = 0.9 and ε (hot plate) = 0.6. If a polished aluminum shield is placed between them, find the percentage reduction in the heat transfer. Take ε (shield) = 0.4.
26.	922516114136	SHAMOON ASHICK S	Explain the terms solar radiation and green house effect.
27.	922516114137	SHANKAR M	A cylindrical body of 300 mm diameter and 1.6 m height is maintained at a constant temperature of 36.5 ºC. The surrounding temperature is 13.5 ºC. Find out the amount of heat t be generated by the body per hour if $\rho = 1.025$ kg/m^3, $c_p = 0.96$ kJ/kg ºC, $\nu = 15.06 \times 10^{-6}$ m^2/s. k= 0.0892 kJ/m-h- ºC and $\beta = 1/298$ K^{-1}, Assume $Nu = 0.12\ (Gr.Pr)^{1/3}$.
28.	922516114138	SIRANJEEVI R	Explain Reynolds analogy for forced convection.
29.	922516114139	SIVA K	Air at 20 ºC and at a pressure of 1 bar is flowing over a flat plate at a velocity of 3 m/s. The plate is 280 mm wide and 280 mm in length and maintained at 56 ºC. The properties of air at bulk mean temperature are given as: $\rho = 1.1374$ kg/m^3, k = 0.02732 W/m ºC, c_p= 1.005 kJ/kgK, $\nu = 16.768 \times 10^{-6}$ m^2/s, Pr = 0.7.

S	REG. NO	NAME OF THE STUDENTS	ASSIGNMENT DETAILS
			Determine: (a) Flow is laminar or turbulent, (b) Boundary layer thickness, (c) Thermal boundary layer thickness, (d) Local convective heat transfer coefficient, (e) Average convective heat transfer coefficient, (f) Rate of heat transfer by convection, (g) Local friction coefficient, (h) Average friction coefficient.
30.	922516114140	SIVAKUMAR M	A 50 cm × 50 cm copper slab 6.25 mm thick has a uniform temperature of 300 ºC. Its temperature is suddenly lowered to 36 ºC. Calculate the time required for the plate to reach the temperature of 108 ºC. Take $\rho = 9000$ kg/m^3, c = 0.38 kJ/kg ºC, k = 370 W/m ºC and h = 90 W/m^2 ºC.
31.	922516114141	SIVAPRASANTH M	Define a fin and also obtained the expression for temperature distribution and heat flow rate in a rectangular fin. Calculate the amount of energy required to solder two very long pieces of bare copper wire 1.625 mm in diameter with solder that melts at 195 ºC. The wires are positioned vertically in air at 24 ºC. Assume the heat transfer coefficient on the wire surface is 17 W/m^2 ºC and thermal conductivity of wire alloy is 335W/m ºC.
32.	922516114142	SIVARAMAN T	Define critical thickness of radius and derive an expression for critical thickness of radius for a sphere. A wire of 6.5 mm diameter at a temperature of 60 ºC is to be insulated by a material having k = 0.174 W/m ºC. Convection heat transfer coefficient (h_0) = 8.722 W/m^2 ºC. The ambient temperature is 20 ºC. For maximum heat loss, what is the minimum thickness of insulation and heat loss per meter loss? Also find percentage increase in heat dissipation.
33.	922516114143	SIVA SARAVANAN N	A steam pipe of 160 mm inside diameter and 5 mm thick having k = 58 W/m ºC is covered with first layer of insulating material 30 mm thick having k = 0.17 W/m ºC and second layer of insulating material 50 mm thick having k = 0.093 W/m ºC. The temperature of the steam passing through the pipe is 300 ºC and ambient air temperature surrounding the pipe is 30 ºC. Taking inner and outer heat transfer coefficients 30 and 5.8 W/m^2 ºC

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			respectively, find the heat lost per meter length of pipe.
34.	922516114144	STANLY THOMAS	An exterior wall of a house may be approximated by a 0.1 m layer of common brick (k = 0.7 W/m ºC) followed by a 0.04m layer of gypsum plaster (k = 0.48 W/m ºC).What thickness of loosely packed rock wool insulation (k = 0.065 W/m ºC) should be added to reduce the heat loss or (gain) through the wall by 80 percent?
35.	922516114145	SUBASH C	The temperatures at the inner and outer surfaces of a boiler wall made of 20 mm thick steel and covered with an insulating material of 5 mm thickness are 300 ºC and 50 ºC respectively. If the thermal conductivities of steel and insulating material are 58 W/m ºC and 0.116 W/m ºC respectively, determine the rate of heat flow through the boiler wall.
36.	922516114146	SUBASH M	Obtain an expression for general heat conduction equation in polar coordinates.
37.	922516114147	SURENDRAN P	Explain Reynolds analogy for forced convection
38.	922516114148	SURESH R	Explain the mechanism of forced convection and free convection.
39.	922516114149	SURYA P	Derive Von Karman integral momentum equation.
40.	922516114150	SURYA KUMAR S	Explain the boundary layer over a flat plate with neat sketch.\
41.	922516114151	SYED MUBARAK SADHAM S	Derive an expression of the rate of heat transfer for Lumped capacitance method.
42.	922516114152	TAMILAZHAGAN K	Define efficiency and effectiveness of the fin and developed a relation between them.

S	REG. NO	NAME OF THE STUDENTS	ASSIGNMENT DETAILS
43.	922516114153	THAMARAI SELVAN M M	Write a brief note on radiation exposure from sun and the various spectral properties included in it.
44.	922516114154	THESIGAN K	With a practical study compare the effectiveness of conventional and modern heat exchangers.
45.	922516114155	VASANTHAKUMAR R	(i). Derive the relation for heat exchange between infinite parallel planes. (ii). Consider double walls as two infinite parallel planes. The emissivity of the walls is 0.3 and 0.8 respectively. The space between the walls is evacuated. Find the heat transfer per unit area when inner and outer surface temperature is 300 K and 260 K. To reduce the heat flow, a shield of polished aluminium of emissivity 0.05 is inserted between the walls. Find the reduction in heat transfer. (May/June 2014)
46.	922516114156	VASHANTH M	a counter flow heat exchanger, water at 20^{o}C flowing at the rate of 520 kg/hr. It is heated by oil of specific heat 2100 J/kgK flowing at the rate of 520 kg/hr at inlet temp of 45^{O}C. Determine the following, (i) Total heat transfer (ii) Outlet temperature of water (iii) Outlet temperature of oil. Take, overall heat transfer co-efficient is 1000W/m^{2}K and heat exchanger area as 1 m^2.
47.	922516114157	VENGATESH S	Hot exhaust gases which enter a cross flow heat exchangers at 300ºC and leaves at 100ºC is used to heat water at flow rate of 1kg/s from 35ºC to 125ºC. The specific heat of gas is 1 kJ/kgK and the overall heat transfer coefficient based on the gas side surface is 100 W/m^{2}K. Find the required area using LMTD and NTU method.
48.	922516114158	VIGNESH D	What is a black body? A 20cm diameter spherical ball at 527^{o} C is suspended in the air. The ball closely approximates a black body. Determine the total blackbody emissive power and spectral back body emissive power at a wavelength of 3 µm. (May/June 2013)

S	REG. NO	NAME OF THE STUDENTS	ASSIGNMENT DETAILS
49.	922516114159	VIGNESH GURU K	Discuss briefly the pool boiling regimes of water at atmospheric pressure.
50.	922516114160	VINCENT A	Derive a general heat conduction equation for a hollow cylinder.
51.	922516114161	VINOTH A	Draw the velocity and temperature profiles for free convection on a hot vertical plate.
52.	922516114162	VISHNU G	Define mass transfer coefficient. Air at 1 bar pressure and 25^0C containing small quanties of iodine flows with a velocity of 5.2 m/s. inside a tube having an inner diameter of 3.05 cm. Find the mass transfer coefficient for iodine from the gas stream to the wall surface. If C_m is the mean concentration of iodine in Kg. mole/ m^3 in the air stream, find the rate of deposition of iodine on the tube surface by assuming surface is a perfect for iodine deposition. Assume D= .0843 cm^2/s.
53.	922516114163	YOHESH WARAN K	Write the expression for isothermal evaporation of water into gas with a neat sketch (ii) Air at 35^0 C and 1 atmosphere flows at a velocity of 60 m/s over (i) flat plate 0.5 m long (ii) a sphere 5 cm in diameter. Calculate the mass transfer coefficient of water in air. Neglect the concentration of vapour in air.

V.S.B. ENGINEERING COLLEGE, KARUR

Department of Mechanical Engineering

Academic Year: 2018-2019 (ODD Semester)

ASSIGNMENT -I

Metrology and Measurements

Class/Semester : III Year / V Semester B.E. Mechanical Engineering "A" Section

Faculty Name : M.P.Gowtham

Sl. No.	Reg. No.	Name of the Student	Assignment Topics
1.	922516114001	AAKASH S	State and explain five basic elements of measuring system
2.	922516114002	ABILASH V	Describe with net sketch International prototype meter (Material length standard) stating material composition and limitation
3.	922516114003	AJITH R	Differential line standard and end standard.
4.	922516114004	AJITH S	Explain various types of Errors in measurement and state how they can take care of.
5.	922516114005	AJITH KUMAR S	Explain Optical measuring techniques
6.	922516114006	AKASH P	Explain construction , working and principle of following: Vernier caliper,Slip gauge
7.	922516114007	ALEX PANDIYAN S	Explain profile projector.
8.	922516114008	ALLEN VIJAY V.N	Explain precision instrumentation based on laser principle.
9.	922516114009	ALWIN GEO JOHNSON	Explain Surface Texture
10.	922516114010	ARASAVIL CLINTON T	Explain the elements of surface

			Roughness
11.	922516114011	ARAVINTH MADHU P	Explain Parkinson gear tester with neat sketch.
12.	922516114012	ARULKUMAR R	Explain radiation pyrometer.
13.	922516114014	BALASUBRAMANI K	Explain with neat sketch types of expansion thermometer stating applications
14.	922516114015	BALASUBRAMANI M	Explain construction , working and principle of following:Autocollimator, Clinometers
15.	922516114016	BHUVANESWARAN T	Explain absorption dynamometers
16.	922516114017	CHARAN KUMAR P	With the help of a neat sketch explain the working of Tomlinson's surface meter and Profilometer
17.	922516114019	DEEPAK G	Explain different types of load cell.
18.	922516114021	DHARANIRAJ K	Explain Standardization and adjustment methods
19.	922516114022	DHIVAKARAN C	Explain the need of inspection
20.	922516114023	ELANGOVAN M	Explain working principle of LVDT
21.	922516114024	ELSON KURIAN EZEKIEL	Explain the term Roughness used in surface finish
22.	922516114025	ESWARAMOORTHI K	Explain the term Effective profile used in surface finish
23.	922516114026	GOKUL S	explain the working of Tomlinson's surface meter and Profilometer.
24.	922516114027	GOKUL V	Explain alignment test for lathe machine.
25.	922516114028	GOKULAKRISHNA I	Describe with sketch the construction and use of gear tooth vernier caliper.
26.	922516114029	GOKUL KUMAR M	Explain Optical measuring techniques.
27.	922516114030	GOPIKRISHNAN M	Explain electric and photoelectric techometers
28.	922516114031	GOWSIK U	Explain filled system thermometers.

29.	922516114033	GOWTHAM R	Explain with sketch Measurement of effective diameter by two wire method stating limitation.
30.	922516114034	GOWTHAM T	Explain Optical pyrometer.
31.	922516114035	GOWTHAMAN P	Explain filled system thermometers.
32.	922516114036	GOWTHAMKUMAR S	Explain profile projector
33.	922516114037	GUGAN S	Explain construction , working and principle of Sine bar and sine Centre
34.	922516114038	GUNA K.V	Explain construction , working and principle of Telescopic gauge
35.	922516114039	HANISH R	Explain construction , working and principle of Vernier depth gauge
36.	922516114040	HARIESH P.K	Explain construction , working and principle of Combination square set
37.	922516114042	HARIHARAN R	Explain with neat sketch three wire method of measuring effective diameter of screw thread.
38.	922516114043	HARI PRASATH M	Explain resistance thermocouple with a neat sketch.
39.	922516114044	HARSHAVARTHAN A M	Compare advantages of thermocouple and thermistors
40.	922516114045	JAGADEESH M	Explain bridge arrangement.
41.	922516114046	JASWANTH P	Explain the term Waviness used in surface finish
42.	922516114047	JOEL E	Explain the term Center of profile used in surface finish
43.	922516114048	JOSELIN MANO J	Explain construction , working and principle of Vernier bevel protractor
44.	922516114049	KALAIYARASAN G	Describe with sketch the construction and use of gear tooth vernier caliper. How is the gear tooth thickness at PCD

			measured?
45.	922516114050	KALIRAJ K	Explain radiation and optical pyrometer
46.	922516114051	KAMESH V	Explain construction , working and principle of Johansson mikrokator
47.	922516114052	KANTHAVEL RAJ S	Explain construction , working and principle of Sigma comparator
48.	922516114054	KARTHIKEYAN P	Explain gauge factor
49.	922516114301	ARUN KUMAR M	Differential line standard and end standard
50.	922516114302	CHRISTOBHER RAJA A	Explain construction , working and principle of Angle dekkor
51.	922516114304	MUKESH K	Explain with sketch the construction and working of micrometer.
52.	922516114305	MUPPUDATHI MUTHU I	Explain different types of load cell
53.	922516114307	NAVEEN KUMAR V	Explain construction , working and principle of Dial indicator
54.	922516114308	PON ARAVINTHAN	Explain piezoelectric Accelerometer
55.	922516114309	SIVA SANDEEP D	Explain Tool makers microscope

Faculty Signature **HoD**