Hall Ticket Number :										

R-13

Code: 1G534

II B.Tech. I Semester Supplementary Examinations August 2021

Machine Drawing

(Mechanical Engineering)

Max. Marks: 70 Time: 4 Hours

Section-I

Answer any ***two*** of the following **2X4=8M**

1. Sketch the conventional representation of
   (a) Internal threads and
   (b) Assembled threads in section. 4M
2. Sketch all screw thread forms. 4M
3. Sketch any one type of machine screw of 10 mm diameter. 4M
4. Sketch any one type of bolt. 4M

Section-II

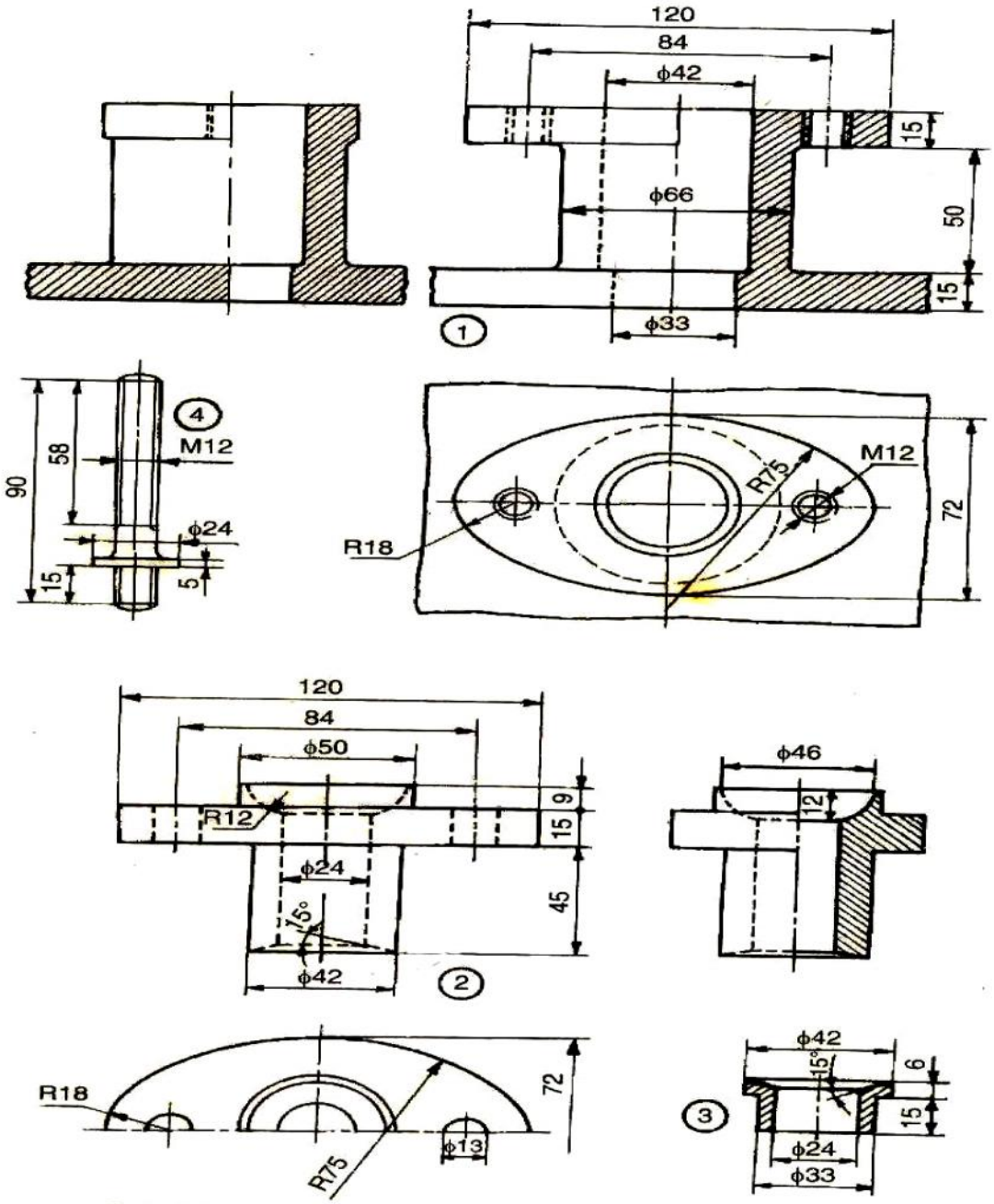
Answer any ***two*** of the following **2X10=20M**

1. Draw
   (a) Sectional view from the front and
   (b) View from the above of a double riveted, double strap, butt joint to join plates of thickness 10 mm. 10M
2. Draw the top view and sectional front view of single riveted but joint with double cover plates. The thickness of the plate is 9mm. show at least three rivets. Indicate all the dimensions. Use snap headed rivets. 10M
3. Draw the following views of a SOCKET and SPIGOT COTTER JOINT used for joining two rods of diameter 20mm:
   a) Sectional front view
   b) A view looking from socket end 10M
4. Sketch the necessary views of a foot-step bearing for supporting a shaft of diameter 50 mm. Give all important proportionate dimensions. 10M

Section-III

Answer the following question **1X42=42M**

1. Assemble all parts of the stuffing box for a vertical steam engine, shown in Fig. and draw the
   (i) Half sectional view from the front, with left half in section,
   (ii) Half sectional view from the right and
   (iii) View from above.



Parts list

Part No.	Name	Matl	Qty
1	Body	CI	1
2	Gland	Brass	1
3	Bush	Brass	1
4	Stud	MS	2
5	Nut, M12	MS	2

Stuffing box 42M

***

Hall Ticket Number :										

R-13

Code: 1GC31

II B.Tech. I Semester Supplementary Examinations August 2021

Mathematics-II

(Common to CE & ME)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

****

1. Find the Eigen values and Eigen vectors of the matrix $A=\begin{bmatrix}1 & 1 & 3\\ 1 & 5 & 1\\ 3 & 1 & 1\end{bmatrix}$. 14M

2. Find the half-range Fourier sine series for f(x) =ax+b in 0<x<1. 14M

3. Solve the by the method of separation of variables
$4u_x + u_y = 3u \text{ and } u(0,y) = e^{-5y}$. 14M

4. a) Determine the root of $x^3 - 4x + 1 = 0$ by method of false position. 7M

   b) Find a root of the equation $x^3 - 4x - 9 = 0$ using Bisection method. 7M

5. a) Obtain Picard's second approximate solution of the initial value problem
$\frac{dy}{dx} = \frac{x^2}{y^2+1}$, $y(0) = 0$ .Find $y(1)$. 7M

   b) Given that $\frac{dy}{dx} = 2 + \sqrt{xy}$, $y(1) = 1$. Find $y(2)$ in steps of **0.2** using the Euler's method. 7M

6. Determine $\frac{dy}{dx}$ at $x = 0$ from the following data

x	0	1	2	3	4	5
y	4	8	15	7	6	2

14M

7. a) If u is a harmonic function, show that $w = z^2$ is not a harmonic function unless u is a constant. 7M

   b) Find the analytic function whose real part is $e^{2x}(x\ \cos 2y - y\ \sin 2y)$. 7M

8. Use Cauchy's integral formula to evaluate $\int_C \frac{\sin^2 z + \cos^2 z}{(z-1)(z-2)} dz$ where C is the circle $|z| = 3$. 14M

***

Hall Ticket Number :										

R-11

Code: 1G533

Last Chance Special Supplementary Examinations July 2021

II B.Tech. I Semester Supplementary Examinations July 2021

Thermodynamics

(Mechanical Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

****

1.	a)	Discuss the macroscopic and microscopic point of view of thermodynamics.	7M
	b)	Classify thermodynamics systems with a suitable example for each.	7M
2.	a)	Derive Steady Flow Energy Equation for Turbine	6M
	b)	Define zeroth law of Thermodynamics. Explain how it is basis for the temperature measurement.	8M
3.	a)	Show that violation of Kelvin-Plank statement leads to violation of Clausius statement and vice-versa.	6M
	b)	An engine operating on a Carnot cycle works with in temperature limits of 600K and 300K. If the engine receives 2000 KJ of heat, evaluate the work done and thermal efficiency of the engine.	8M
4.	a)	Derive the four Maxwell's equations.	5M
	b)	A block of iron weighing 100 kg and having a temperature of 100^0C is immersed in 50 kg of water at a temperature of 20^0C. What will be the change of entropy of combined system of iron and water? Specific heats of iron and water are 0.45 and 4.18 kJ/kg K respectively.	9M
5.	a)	Derive Clausius –Clapeyron equation.	7M
	b)	Find the internal energy of 1 kg of steam at 20 bar when i) it is superheated, its temperature being 400 ^{0}C ii) it is wet dryness being 0.9	7M
6.		Explain Vander wall's equation of state and derive the constants for the equation	14M
7		A gas mixture consists of 0.4 kg CO, 1.1 kg of CO_2 and1.5 kg of N_2. Determine i) Mass fraction of each component .ii) Mole fraction of each component. iii) Average molar mass of the mixture. iv) Gas constant of the mixture.	14M
8.	a)	With a neat sketch explain the working of Diesel cycle and derive the expression for its thermal efficiency	6M
	b)	Compare otto, diesel and dual cycles	8M

***