

PANDIAN SARASWATHI YADAV ENGINEERING COLLEGE

(Approved by AICTE & Affiliated to Anna University, Chennai)

Madurai - Sivagangai Highway, Arasanoor, Thirumansolai Post, Sivagangai Dt. - 630 561, Tamilnadu
Mobile : 9842102628, 7373002628 Email: info@psyec.edu.in Website : www.psyec.edu.in

City Office : 10, Pandian Saraswathi St, Sivagami Nagar, Narayanapuram, Madurai - 625 014. Telefax- 0452 2682338, Mobile : 98423-02628

Department of Mechanical Engineering,
Academic Year 2022-23

Internal Assessment Test 2

Sub Code: **ME8593**

Sub Name: **Design of Machine Elements**

Year /SEM: **III / V**

Date: 28.10. 22

Max. Marks: 50 Marks

Duration: 11.20 am- 01.00 pm (90 Minutes)

Part-A

Answer all the questions

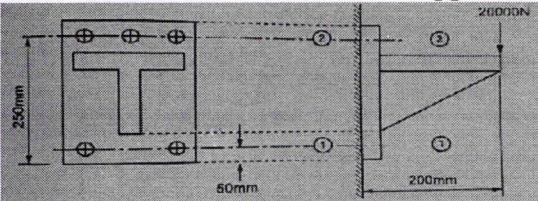
(7×2=14)

Q. No	Question	M	CO	BTL
1	Give Classification of Couplings	2	2	2
2	Difference between keys and splines?	2	2	1
3	State different types of keys.	2	2	2
4	Give advantages of threaded joints	2	3	2
5	State two types of eccentric welded connections	2	3	4
6	Determine the safe tensile load for bolt M20 assuming a safe tensile stress of 40MPa	2	3	2
7	How is a bolt designated? Give examples	2	3	2

Part-B

Answer all the questions

(3×12=36)

Q. No	Question	M	CO	BTL
8.	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 couplings.	12	2	4
9.	A bracket is shown in figure is fitted to a wall with 5 bolts, three at the top and two at the bottom with all the bolts equally spaced. A. load of 20000N is acting at an eccentricity of 200mm. Vertical distances of first and second rows from the hinge point are 50 mm and 250 mm respectively. Select a suitable bolt size for this application 	12	3	3
10	Design a knuckle joint for tie rod of circular section for a maximum pull of 70 kN. The ultimate strength of material against tearing is 420 N/mm ² . The shearing strength of material is 396 N/mm ² . Take FOS=6	12	3	4

Prepared by

HOD

Principal



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Department of Mechanical Engineering,

Academic Year 2022-23

Internal Assessment Test II

Sub Code: **ME 8692**

Sub Name: **Finite Element Analysis**

Year /SEM: **III / VI**

Date:13.04.2023

Max. Marks: 50 Marks

Duration: 90 Minutes

Part-A (7×2=14)

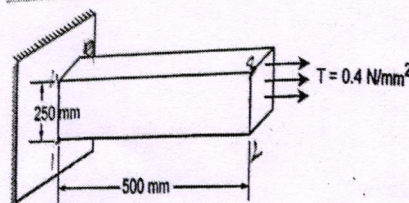
Answer all the questions

Q. No	Question	M	CO	BTL
1	List the types of loading act on the structure?	2	2	2
2	Mention the Natural Coordinates?	2	2	1
3	Define Shape function? ?	2	2	2
4	State the Properties of a stiffness Matrix?	2	2	2
5	Write a strain Displacement matrix for CST element	2	3	4
6	State assumptions in the theory of pure torsion	2	3	2
7	What is CST element?	2	3	2

Part-B (3×12=36)

Answer all the questions

Q. No	Question	M	CO	BTL
8.	A steel rod of diameter $d=2\text{cm}$, length $L=5\text{ cm}$ and thermal conductivity $k=50\text{ W/m}^\circ\text{C}$ is exposed at one end to a constant temperature of 320°C . The other end is in ambient air of temperature 20°C with a convection coefficient of $h=100\text{ W/m}^2\text{ }^\circ\text{C}$. Determine the temperature at the midpoint of the rod	12	2	4
9.	A thin Plate is subjected to surface traction as shown in fig.14. calculate the global stiffness matrix. Take $t=25\text{mm}$, $E=2\text{Gpa}$ and Poisson ratio $(\nu)=0.3$	12	3	3





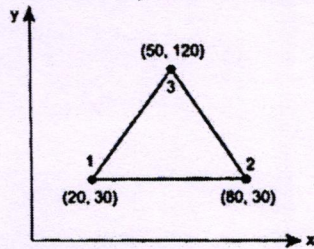
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- 10 The Determine the Stiffness Matrix for the constant strain triangular element shown in figure the coordinates are given in units in millimetres .assume plane stress conditions Take $E=210\text{GPa}$, $\nu=0.25$ and $t=10\text{mm}$ 12 3 4



[Signature]
Faculty Incharge

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HOD/MECH

[Signature]
Principal