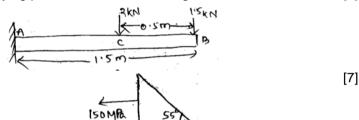
Sub- SOM
Branch - Automobile Engg.

Sub- SOM Branch - Automobile Engg.

- 1. A hollow steel tube 4m long has external dia of 120mm. In order to determine the internal diameter, the tube was subjected to a tensile load of 400 KN and extension was measured to be 2 mm. If the modulus of elasticity for the tube material is 200 GPa, determine the internal diameter of the tube.
- 2. Draw the shear force and bending moment diagram for a cantilever beam of 1.5m span carrying point loads as shown in figure. [7]



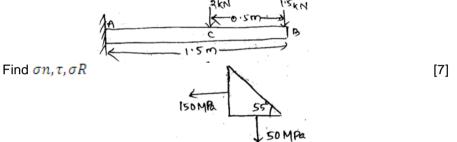
50 MPa

the internal diameter, the tube was subjected to a tensile load of 400 KN and extension was measured to be 2 mm. If the modulus of elasticity for the tube material is 200 GPa, determine the internal diameter of the tube. [6]

2. Draw the shear force and bending moment diagram for a cantilever beam of

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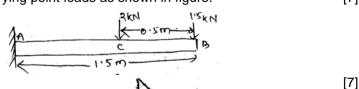
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Sub- SOM
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Sub- SOM
Branch - Automobile Engg.

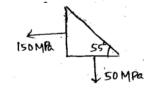
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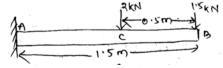
3. Find σn , τ , σR

3.

Find $\sigma n, \tau, \sigma R$

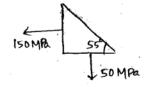


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3. Find σn , τ , σR

3.



[7]

Sub- Engg. Math-III Branch - Elect., Mech & Auto Engg.

Sub- Engg. Math-III Branch - Elect., Mech & Auto Engg.

Answer any two:

[10x2]

- Solve $\frac{d^2y}{dx^2} + 5\frac{dy}{dx} + 6y = e^{-2x} + \sin 2x$
- 2. Find the root at the equation. $x^3 - 5x + 1 = 0$ which lies between 2 & 3, using b section method comet up to 1 decimal place.
- 3. Find the interval in which roots are find out.

i)
$$x^3 - 5x + 1 = 0$$
 ii) $x^4 - 5x - 10 = 0$

ii)
$$x^4 - 5x - 10 = 0$$

4. Solve
$$\frac{d^2y}{dx^2} + 2y = x^2e^{3x} + e^x \cos 2x$$

Sub- Engg. Math-III Branch - Elect., Mech & Auto Engg.

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Sub- Engg. Math-III Branch - Elect., Mech & Auto Engg.

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Sub- Thermal Engg.-I Branch - Mechanical Engg.

its type.

Sub- Thermal Engg.-I Branch - Mechanical Engg.

[5]

Ansı	ver all questions.	Ansv	ver all questions.	
1.	Define the followings [1x5] a) Property b) Thermodynamic equilibrium c) Process d) Specific gravity e) Cycle	1.	Define the followings a) Property b) Thermodynamic equilibrium c) Process d) Specific gravity e) Cycle	[1x5]
2.	Write down the differences between thermo dynamic work & thermo	2.	Write down the differences between thermo dynamic work & t	
3.	dynamic heat. [4] Differentiate between sensible heat & latent heat. [4]	3.	dynamic heat. Differentiate between sensible heat & latent heat.	[4] [4]
3. 4.	Differentiate between intensive property & extensive property. [2]	3. 4.	Differentiate between intensive property & extensive property.	
5.	What do you mean by thermo dynamic system? Explain in detail about	5.	What do you mean by thermo dynamic system? Explain in detail	
	its type. [5]		its type.	[5]
	Sub- Thermal EnggI Branch - Mechanical Engg.		Sub- Thermal EnggI Branch - Mechanical Engg.	
Ansı	ver all questions.	—— Ansv	ver all questions.	
1.	Define the followings [1x5] a) Property	1.	Define the followings [a) Property	[1x5]
	b) Thermodynamic equilibrium		b) Thermodynamic equilibrium	
	c) Process		c) Process	
	d) Specific gravity		d) Specific gravity	
2.	e) Cycle Write down the differences between thermo dynamic work & thermo	2.	 e) Cycle Write down the differences between thermo dynamic work & t 	hormo
۷.	dynamic heat. [4]	۷.	dynamic heat.	[4]
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[5]

its type.

Sub- Engineering Material Branch - Mechanical Engg.

Describe physical and chemical properties of engineering material. [5]

Answer all the question.

Classify Engineering material.

1.

2.

Sub- Engineering Material Branch - Mechanical Engg.

Describe physical and chemical properties of engineering material. [5]

[5]

3.	Explain the mechanical properties of material. [10])]	3.	Explain the mechanical properties of material. [10]
	Sub- Engineering Material			Sub- Engineering Material
	Branch - Mechanical Engg.			Branch - Mechanical Engg.
	uor all the guestion	_		vor all the guestion
1.	ver all the question. Classify Engineering material.	51	1.	ver all the question. Classify Engineering material. [5]
2.	Describe physical and chemical properties of engineering material. [5]		2.	Describe physical and chemical properties of engineering material. [5]
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[5]

1.

Answer all the question.

Classify Engineering material.

Sub- AE & OPAM Branch - Electrical Engg.

Sub- AE & OPAM Branch - Electrical Engg.

Answer all questions.

Each question carries 5 marks.

- 1. Explain due V-I characteristics of Pn junction diode.
- 2. In a common base connection, due emitter current is MA. If are emitter circuit is open, due collector, due collector current is 500 μ A. Find the total collector current.

Given that $\alpha = 0.92$

- 3. A common base transistor amplifier has an input resistance of 5 &! and output resistance of 100 K &! . The collector 10 ad is 2K &! if a signal of 500mr is applied between emitter and base. Find voltage amplification assume due to the nearly one.
- 5. What is a transistor and explain the operation of transistors?

Sub- AE & OPAM Branch - Electrical Engg.

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Sub- EME Branch - Electrical Engg.

Sub- EME Branch - Electrical Engg.

[5x4=20] Answer any four questions. Answer any four questions. [5x4=20] Define Cp and Cv and find out relation between them. Define Cp and Cv and find out relation between them. 1. 1. 2. Write short note on cabran boiler. 2. Write short note on cabran boiler. 3. Write perfect gas law. Write perfect gas law. 4. Compare water tube boiler and fire tube boiler. 4. Compare water tube boiler and fire tube boiler. Write short note on Wilcox boiler. 5. Write short note on Wilcox boiler.

[5x4=20]

Sub- EME Branch - Electrical Engg.

Sub- EME Branch - Electrical Engg.

Answer any four questions. Define Cp and Cv and find out relation between them.

- Write short note on cabran boiler.
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Answer any four questions.

[5x4=20]

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- 2. Write short note on cabran boiler.
- 3. Write perfect gas law.
- 4. Compare water tube boiler and fire tube boiler.
- 5. Write short note on Wilcox boiler.

[2]

Answer all.

- 1.a) Define principle of superstition.
- b) Derive the relation between E and K [5]
- c) Determine the change in length of bar as shown below.

bokn A B C
$$\rightarrow$$
 20kN \rightarrow 40kN \rightarrow 40kN \rightarrow 40kN \rightarrow 40kN \rightarrow 40kN \rightarrow Given- $E = 2006Pa$, $A = 100 \text{ mm}^2$

- d) A cylindrical shell 2m long 1m internal diameter is made up of 20 mm thick plates. Find the hoop and longitudinal stress with shell material if it is subjected to an internal pressure of 5 MPa.
- e) A bar is subjected to a tensile stress of 100 MPa. Determine normal and shear stress across a place making an angle of 60° with a direction normal to the direction of tensile stress.

Answer all.

- 1.a) Define principle of superstition.
- [2]
- b) Derive the relation between E and K
- [5]
- c) Determine the change in length of bar as shown below.

bokn A B C

$$\Rightarrow 20kN$$
 $\Rightarrow 40kN$
 $\Rightarrow 40kN$ $\Rightarrow 40kN$
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Sub- Construction Technology Branch - Civil Engg.

Sub- Construction Technology Branch - Civil Engg.

1.	Define the following - [2X!	5] 1.	Define the following -	[2X5]
i)	Hazardous building.	i)	Hazardous building.	
ii)	Framed structure	ii)	Framed structure	
iii)	Dead load	iii)	Dead load	
iv)	Combined footing	iv)	Combined footing	
v)	Pile foundation	v)	Pile foundation	
2.	Write a short note on shallow foundation with neat sketch. [1x5]	5] 2.	Write a short note on shallow foundation with neat sketch	
3.	Differentiate between shallow foundation and pile foundation. [1x5]	5] 3.	Differentiate between shallow foundation and pile foundation.	[1x5]

Sub- Construction Technology Branch - Civil Engg.

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3.	Differentiate between shallow foundation and pile foundati	on. [1x5]	3.	Differentiate between shallow foundation and pile foundation	ı. [1x5]

Sub- Survey-I Branch - Civil Engg.

Sub- Survey-I Branch - Civil Engg.

[5]

[5]

- 1. Write the types of surveying.
- [5]
- 2. Write short note on indirect surveying operation. [5]
- 3. Write down the different obstacle on chaining. [5]
- 4. A steel tape was exactly 30m long at 20° C when supported throughout its length under a pull of 15 kg a line was measured with a pull of 10 kg applied to the tape of a mean temperature of 13° C and found to be 810 m long. The cross sectional area of the tape is 0.03 cm², total weight of the tape is 0.65 Kg, for steel = 11×10^{-6} s per °C and E= 2.1×10^{6} Kg/cm². Find the true length of line. [5]
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Sub- Survey-I Branch - Civil Engg.

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Sub- EME Branch - Electrical Engg.

Sub- EME Branch - Electrical Engg.

	Group-A [2x5]			Group-A [2x5]	
1. a)	Define conductor, semi conductor and insulator with example.	[2] [2]	1. a)	Define conductor, semi conductor and insulator with example.	[2] [2]
b)	What is ACSR conductor?	[2]	b)	What is ACSR conductor?	[2]
c)	What is skin effect ?	[2]	c)	What is skin effect?	[2]
ď)	Name the materials which are used in below applications.	[2]	ď)	Name the materials which are used in below applications.	[2]
i)	Sliding contacts of starter.		i)	Sliding contacts of starter.	
ií)	Resistor for precision instruments.		iĺ)	Resistor for precision instruments.	
iii)	Elements of Electric Oven.		iii)	Elements of Electric Oven.	
ií) iii) iv)	Commutator segments.		iv)	Commutator segments.	
e)	What is super conductivity of a material?	[2]	e)	What is super conductivity of a material?	[2]
·	Answer any Two (Group-B)		•	Answer any Two (Group-B)	
2.	Name any four low resistive materials with their properties?	[5]	2.	Name any four low resistive materials with their properties?	[5]
3.	What is resistivity and what are the factors affecting the resistiving	of	2. 3.	What is resistivity and what are the factors affecting the resistiving	, of
	a materials ?	[5]		a materials ?	[5]
4.	What are the high resistive materials, write their properties and		4.	What are the high resistive materials, write their properties and	
	application ?	[5]		application?	[5]

Sub- EME Branch - Electrical Engg.

Sub- EME Branch - Electrical Engg.

	Group-A [2x5]			Group-A [2x5]	
1. a)	Define conductor, semi conductor and insulator with example.	[2]	1. a)	Define conductor, semi conductor and insulator with example.	[2]
b)	What is ACSR conductor?	[2] [2] [2]	b)	What is ACSR conductor?	[2]
c)	What is skin effect ?	[2]	c)	What is skin effect ?	[2]
d)	Name the materials which are used in below applications.	[2]	d)	Name the materials which are used in below applications.	[2]
i)	Sliding contacts of starter.		i)	Sliding contacts of starter.	
ii)	Resistor for precision instruments.		ii)	Resistor for precision instruments.	
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iv)	Commutator segments.		iv)	Commutator segments.	
e)	What is super conductivity of a material ?	[2]	e)	What is super conductivity of a material?	[2]
	Answer any Two (Group-B)		_	Answer any Two (Group-B)	
2.	Name any four low resistive materials with their properties?	[5]	2. 3.	Name any four low resistive materials with their properties?	[5]
3.	Name any four low resistive materials with their properties? What is resistivity and what are the factors affecting the resistivir a materials?	g of	3.	What is resistivity and what are the factors affecting the resistiving	, ot
	a materials ?	[5]		a materials ?	[5]
4.	What are the high resistive materials, write their properties and application?	[5]	4.	What are the high resistive materials, write their properties and application?	[5]

Sub- Civil Engg. Material Branch - Civil Engg.

Sub- Civil Engg. Material Branch - Civil Engg.

Writ	Write any two from the following : [5x2]		Write any two from the following:		[5x2]
1.	Explain the compressive strength of cement test?		1.	Explain the compressive strength of cement test?	
2.	What are the properties of cement?		2.	What are the properties of cement?	
3.	Classify the stones briefly?		3.	Classify the stones briefly?	
Ans	wer all the questions :	[2x5]	Ansv	wer all the questions :	[2x5]
a)	What are the types of terracotta?		a)	What are the types of terracotta?	
b)	What are the types of tiles?		b)	What are the types of tiles?	
c)	What do you mean by dressing of stones? Write two pure	rpose of it ?	c)	What do you mean by dressing of stones? Write two p	ourpose of it?
d)	What is porcelain? write its types?		d)	What is porcelain? write its types?	
	Sub- Civil Engg. Material Branch - Civil Engg.			Sub- Civil Engg. Material Branch - Civil Engg.	

Write any two from the following: Write any two from the following: [5x2] [5x2] Explain the compressive strength of cement test? Explain the compressive strength of cement test? 1. 1. What are the properties of cement? 2. What are the properties of cement? 2. 3. Classify the stones briefly? Classify the stones briefly? 3. Answer all the questions: Answer all the questions: [2x5] [2x5] What are the types of terracotta? What are the types of terracotta? a) a) b) What are the types of tiles? b) What are the types of tiles? What do you mean by dressing of stones? Write two purpose of it? What do you mean by dressing of stones? Write two purpose of it? c) c) d) What is porcelain? write its types? d) What is porcelain? write its types?

Sub- FMHM Branch - Civil Engg.

Sub- FMHM Branch - Civil Engg.

1.	Answer all the questions :		1.	Answer all the questions :	
a)	What is a specific gravity ?	[2]	a)	What is a specific gravity?	[2]
b)	What do you mean by laminar & turbulent flow?	[2]	b)	What do you mean by laminar & turbulent flow?	[2]
c)	A single U-tube monometer containing mercury connected to th	e pipe in which	c)	A single U-tube monometer containing mercury connected to the	ne pipe in which
	a field of specific gravity 0.8 & having vaccum pressure in it and t	he other and is		a field of specific gravity 0.8 & having vaccum pressure in it and	the other and is
	open to the atmosphere. If the difference is height fluid on the le	ft limb is 15 cm		open to the atmosphere. If the difference is height fluid on the left limb is 15 cm	
	and in right climb is 40 cm find the pressure in it.	[5]		and in right climb is 40 cm find the pressure in it.	[5]
d)	Water is flowing through a pipe having diameter 300 mm	& 200 mm at	d)	Water is flowing through a pipe having diameter 300 mm	n & 200 mm at
	the bottom and upper end respectively. The intensity of pr	ressure at the		the bottom and upper end respectively. The intensity of p	ressure at the
	bottom of the pipe is 24.525 N/m ² & the pressure at the	upper end is		bottom of the pipe is 24.525 N/m ² & the pressure at the	e upper end is
	9.8/N/cm ² . Determine the difference in datum head if the	e rate of flow		9.8/N/cm ² . Determine the difference in datum head if the	ne rate of flow
	through the pipe is 40 lit/s.	[6]		through the pipe is 40 lit/s.	[6]
e)	A horizontal venturimeter with in at diameter 20 cm of	of the throat	e)	A horizontal venturimeter with in at diameter 20 cm	of the throat
	diameter 10 cm is used to measure the flow of oil of specif	ic gravity 0.8.		diameter 10 cm is used to measure the flow of oil of speci	fic gravity 0.8.
	The discharge of oil through venturimeter is 60 L/S. Find t	he reading of		The discharge of oil through venturimeter is 60 L/S. Find	the reading of

the oil mercury in differential manometer take (cd=0.98) [5]

[5]

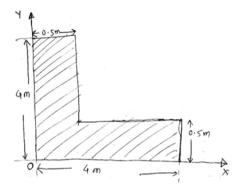
the oil mercury in differential manometer take (cd=0.98)

Sub- MOM Branch - Civil Engg.

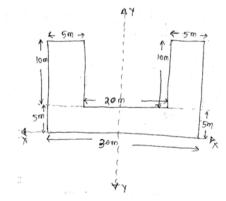
Sub- MOM Branch - Civil Engg.

ANSWER ANY FOUR QUESTIONS.

1. Calculate the MI of the angle section shown in the figure wrt a centroidal axix parallel to x axis. {5}



2. Find out the centroid of the given composite figue.



- 3. Draw the stress ~ strain curve of mild steel with proper explanation of all the points and portions of the curve. {5}
- 4. What is Hook'es law write down all the assumpations along with explanations. (5)
- 5. Write short notes on any two.

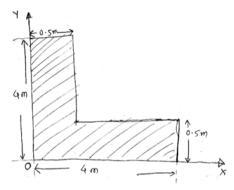
{2.5x2}

{5}

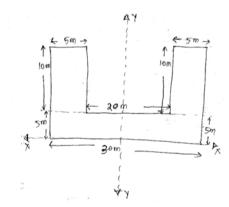
- a) Elasticity
- b) Resilence
- c) Toughness
- d) Fatigue

ANSWER ANY FOUR QUESTIONS.

1. Calculate the MI of the angle section shown in the figure wrt a centroidal axix parallel to x axis. {5}



2. Find out the centroid of the given composite figue.



- 3. Draw the stress ~ strain curve of mild steel with proper explanation of all the points and portions of the curve. {5}
- 4. What is Hook'es law write down all the assumpations along with explanations. (5)
- 5. Write short notes on any two.

{2.5x2}

{5}

- a) Elasticity
- b) Resilence
- c) Toughness
- d) Fatigue