Sub- MT-I
Branch - Auto. Engg.

1. Describe different types of flames used in oxy-acetylene gas welding. {7}
2. Write a short note on impact extrusion with diagram. {7}
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Sub- SOM

Branch - Mech. Engg.

1. Define the following. {1x5}

a) Thin cylinder

b) Circumferential stress

c) Neutral axis

d) Short column

e) Pure bending

2. Draw the S.F. & B.M. diagram of the following loaded beam with S.F. & B.F. at salient points. {8}

3. A cylindrical shell is 400mm internal diameter & 8mm. thick and 1 meter long. Find the change in internal diameter & the length when the cylinder is charged with an internal pressure of 8N/mm^2. Take $E = 2x10^5 N/mm^2$ & $\frac{1}{m} = 0.3$. {7}

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Sub- Engg. Material
Branch - Auto. Engg.

1.	Answer any five question.	{2x5}
a)	What is engineering. material ?	
b)	How engineering material is useful for enggineers ?	
c)	What is spring material ? Derive application of spring material.	
d)	What is ceremics ?	
e)	What is composite materials ?	
f)	What is bearing material ?	
2.	Answer any one question.	{10}
a)	Draw full diagram of iron-carbon equillibrium system.	
b)	What is heat treatment ? Define different types of heat treatment process ?	

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Sub- FM&HM
Branch - Civil Engg.

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1. Answer any two out of three question. {10x2}

a) A single acting reciprocating pump running at 69RPM delivers 0.02 m^3/sec of water. The diameter of piston is 200mm and strike length is 400mm. Calculate the (1st) point theoritical discharge of the pump.

i) Co-efficient of discharge

ii) Slip and the % slip of the pump.

b) i) Describe in detail the basic principle of centrifuge pump with detailed diagram.

ii) Describe the different conditions of floation.

c) Write short notes on.

i) Steady & unsteady flow

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Sub- Engg. Math-III
Branch - Mech. Engg.

---

1. Answer all questions. {5x4}

a) Find the root of the equation $x^3 - 4x - 9 = 0$ using bisection method correct upto three decimal places.

b) Obtain the fourier series for $f(x) = e^{-x}$ in the interval $0 < x \quad 2\pi$.

c) i) Show that if $f(t) = t$, then

$L[f(t)] = \frac{1}{S^2}$

ii) Evaluate the value of $L[f(t)]$ if $f(t) = \sqrt{t}$.

d) Evaluate the following.

i) $L\left[\frac{\sin at}{t}\right]$

ii) $L^{-1}\left[\frac{S^2+1}{S(S+1)^2}\right]$

Sub- Engg. Math-III
Branch - Mech. Engg.

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Sub- SOM
Branch - Auto. Engg.

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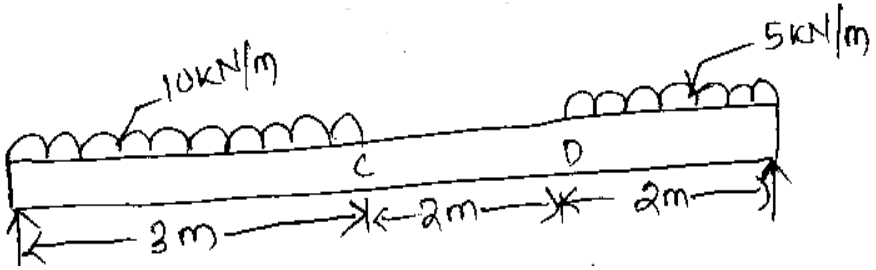
1. Answer all question.

a) For theory of simple bending prove that $\frac{M}{I}=\frac{\sigma}{Y}=\frac{E}{R}$. {7}

Or

For Torsion of circular shaft prove that

b) Draw the shear force and bending moment diagram of the simply supported beam of length 7m carrying uniformly distributed loads as shown in figure.{7}



c) A solid steel shaft rotating at 200rpm, transmitting 150KW. Find the suitable diameter of the shaft, if allowable shear stress is 70MPa. The maximum torque transmitted in each revolution exceeds by the mean by 20%. {6}

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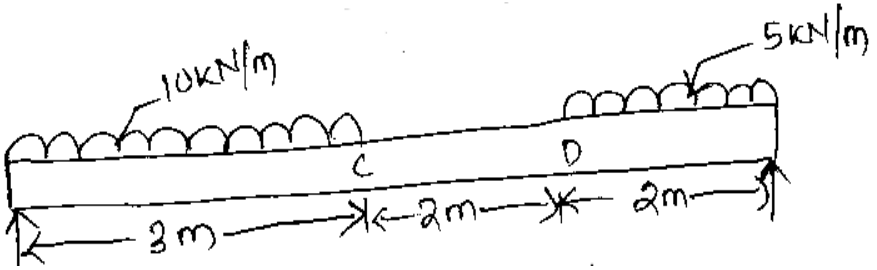

c) A solid steel shaft rotating at 200rpm, transmitting 150KW. Find the suitable diameter of the shaft, if allowable shear stress is 70MPa. The maximum torque transmitted in each revolution exceeds by the mean by 20%. {6}

Sub- Thermal Engg.-I
Branch - Mech. Engg.

Answer all the questions. {5x4}

1. State gas law and define characteristic gas constant.
2. Derive work done during adiabatic expansion and compression process with P-V diagram.
3. Define C_p and C_v and prove C_p-C_v=R.
4. If one kg of an ideal gas is heated at constant pressure from 25^0C to 200^0C, estimate heat added, ideal work done and change in internal energy. Also calculate pressure and final volume, if initial vol. was $2m^3$. (C_p=0.984KJ/KgK, C_v=0.728KJ/KgK. Also find 'R' and ratio of specific hear for gas.

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Sub- Engg. Material
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Answer all the questions.

1. What are the purposes of heat treatment ? {3}
2. What is quenching ? Write different types of quenching media used. {3}
3. Describe composition, properties & use of copper base bearing metals & tin base bearing metals. {7}
4. Differentiate between fiber reinforced & particle reinforced composite. {5}
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Sub- Construction Technology
Branch - Civil Engg.

Answer all the questions.

1. What do you mean by Arches ? Describe Arches with a neat and clear diagram and describing all of its components. {7}
2. Describe the types of doors with a neat sketch. {5}
3. Define plastering and what are the method of plastering. {5}
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Sub- Survey-I
Branch - Civil Engg.

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1. Answer all the questions. {5x2}

a) What is magnetic declination ?

b) Magnetic bearing of a line is $120^0 20'$ declination is $10^0 20'$ E. Find true bearing of the line.

c) What is dip of the magnetic needle ?

d) Write the accessories of plane table survey.

e) If FB of a line is $45^0 20'$ then find the BB of that line.

2. Calculate the bearing of a close area its interior angle are $\angle A = 140^0 10'$, $\angle B = 90^0 8'$, $\angle C = 60^0 20'$, $\angle D = 69^0 20'$ and bearing of AB=$60^0 0'$. {10}

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Sub- Mechanics of Material
Branch - Civil Engg.

Answer all the questions. {5x4}

1. A solid circular shaft of 100mm diameter is to transmit 110cw at 140rpm. Find the intensity of shear stress.
2. A symmetrical section 200mm deep has a moment of inertia of 2.26×10^{-5} m^4 about its neutral axis. Determine the longest span over which, when simply supported the beam would carry a udl of 4KN/m run without the stress due to bending exceeding $125MN/m^2$.
3. A simply supported beam 6m long is carrying a uniformly distributed load of 5KN/m over a length of 3m from the right end. Draw the SFD and BMD and calculate maximum BM.
4. A simply supported beam of length 3m is carrying two point load 3KN and 5KN both at 1m from and right end respectively. Draw the left SFD and BMD.
5. A bar 3m long and 50mm in diameter is acted upon by an axial force of 100KN. Find the length of the 24mm diameter bore, which should be centrally carried out, so that the net elevation be increased by 20%. Take $E=2.1 \times 10^5 MPa$.

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Sub- Civil Engg. Material
Branch - Civil Engg.

Answer all the questions. {5x4}

1. What do you mean by workability ? Describe one test to determine the workability.
2. What is seasoning ? Describe the types of seasoning.
3. Write down the process of distemper.
4. Describe the defects that occur in timber.

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Sub- Engg. Math-III
Branch - All Branch

Answer any one. {10}

1. Find the value of $\int_{1}^{2} \frac{dx}{x}$ by Simpson's rule. Hence obtain the value of $lx2$.

Or

Evaluate $\int_{0}^{1} \frac{dx}{1+x^2}$, by using Simpson's $\frac{1}{3}$ rule. Hence obtain the approximate value of π.

Answer any one. {10}

2. Find root of the given equation $x^3 - 5x + 1 = 0$, using bisection method correct to two decimal places which lics between 2 & 3.

Or

Use Lagrange's interpolation formula to find the value of y when x=10, if the following values of x and y are:

x	5	6	9	11
y	12	13	14	16

Sub- Engg. Math-III
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Sub- EEM
Branch - Elect. Engg.

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1. Answer all the Question(2x5)

a. Define Insulators?
b. What is Permeability?
c. Define ferro Magnetic Material?
d. Write 2 names of Liquid insulating Materials?
e. Define Cuire Point?

2. Answer any two Question (5x2)

a. Explain classification of magnetic materials?
b. Explain properties of insulating material?
c. Write any 2 names of insulating gases and their properties ?

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Sub- EEM
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