AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Approved by AICTE, New Delhi, Recognized by Govt. of Maharashtra,
Affiliated to Savitribai Phule Pune University and recognized 2(f) and 12(B) by UGC
(Id.No. PU / PN/ Engg. / 093 (1992)
(Accredited by NAAC with grade A+)

Department of Chemical Engineering

AY: 2022-23 (Term-II) Date: 09/03/2023

Subject: Process Modeling and Simulation Course Code: 409349

Total Marks: 30

Test-I (Unit-I and II: Conservation Equations, Modeling of Fluid Flow Operations)

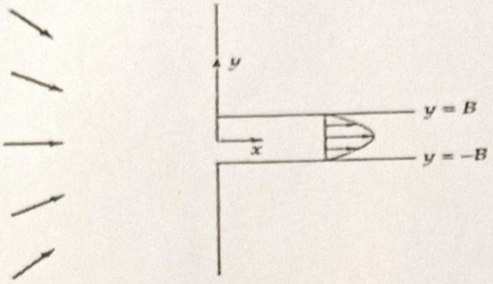
Instruction for the students:

(i) Assume suitable data if required
(ii) Figures to the right indicate full marks.
(iii) Use of programmable calculator is allowed.
(iv) Write all necessary steps.
*(v) Answer **any three** questions*

COs:

CO1: Derive and apply laws of conservation of mass, momentum and energy needed for modelling.
CO2: Develop model equations for Fluid Flow Phenomena.

QN	Questions	Marks	BL	CO
1	Define following terms: a) Modeling and simulation b) Lumped parameter model c) Distributed Parameter model d) State space model e) Degrees of freedom analysis	10	L1	I
2	Applying law of conservation of mass and energy, derive the model equations for stirred heating tank. Make suitable assumptions.	10	L2	I
3	An incompressible Newtonian liquid is flowing very slowly into a thin slot of thickness 2B (in the y direction) and width W (in the z direction). Derive model equation for the system. Make suitable assumptions.	10	L3	II

				
4	Derive 3-D continuity equation for the fluid flow using differential analysis.	10	L3	II
	BL – Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating)			
	CO – Course Outcomes			

Faculty

Module Coordinator

Head

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name MIHIR PARAB Roll No.: 19CH033

Subject PMS Division: B.E Chemical.

Examination Test 1 Day & Date: Thursday 9/3/2023

Question No.	1	2	3	4	5	6	7	8	9	10	Total Marks
Marks											14/15

Examiner Signature

Q1.

→ a) Modeling & Simulation:

Expressing a process in terms of Mathematical equations to achieve desired output of the actual/real life process is called as Modeling.

Types of Models: (i) Linear & Non-linear models.
(ii) Steady & Unsteady models; (iii) Lumped parameter & distributed parameter model.
(iv) State space model & transform domain models.

Simulation → Testing of mathematical models/equations using a computer program or software or by analytical Method is called simulation.

b) Lumped Parameter Models:

Lumped Parameter representation means that special variations are ignored & that the various properties and the state of system can be considered homogenous throughout the entire system.

Eg: Consider a perfectly insulated stirred tank where a hot liq. steam at 50°C is mixed with a cold liq. stream at 10°C. The well mixed assumption means

that the fluid temp in tank is uniform & equal to the exit from tank. Since the temp does not vary with position.

c) Distributed Parameter System:

A distributed parameter system takes into account detailed variations in behaviour from point to point throughout the system. All systems are of course distributed in as there are some variations throughout them. Many times the variations are very small, so they may be ignored & the system can be treated as 'Lumped system'.

Eg: A simple counter current heat exchange → As cold water flows through one side of HEX & is heated by energy transferred from condensing steam stream. This is distributed parameter sys. as the temp. of water is changing with time & position

05 d) State Space Model:

State space models are models that use state variables to describe a system by a set of 1st order differential equations, rather than by one or more n^{th} order differential eqn.

If the set of 1st order differential equation is linear in the state & input variables, the model is ~~reffered~~ referred to as a linear space state model.

e) Degree of freedom:

Degree of freedom is defined as each of a number of independently variable factors affecting the range of states in which a system may exist. In particular any of the directions in which independent motion can occur.

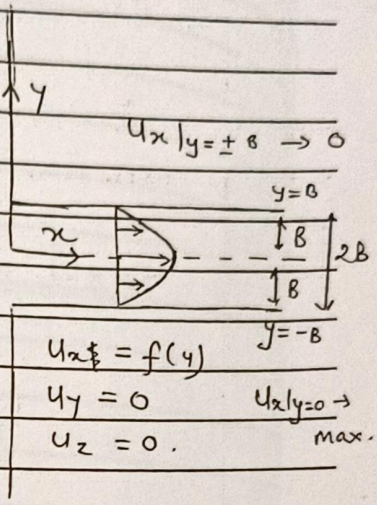
Q3

→ Process → Physical process.

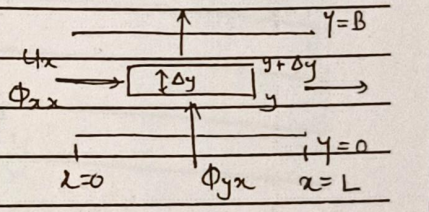
- By Applying law of Conservation of Momentum.

Input − Output + Generation − Consump. = Accul.

⇒ Input = Output ✓



- Assumptions: 1) 1-D flow
2) Steady state flow
3) Physical properties const.
4) Incompressible & isothermal.



$u_x = f(y)$, $u_y = u_z = 0$.

05

- Model Derivation:

Rate of Momentum in $= \left(\Phi_{xx}|_{x=0}\right)(B \cdot W) + \left(\Phi_{yx}|_{y}\right)(L \cdot W)$

Rate of Momentum out $= \left(\Phi_{xx}|_{x=L}\right)(B \cdot W) + \left(\Phi_{yx}|_{y+\Delta y}\right)(L \cdot W)$

By Law of conservation of Momentum.

∴ (Rate of Momentum in) − (Rate of Momentum out) = 0

$$(B \cdot W)\left(\Phi_{xx}|_{x=0}\right) - (B \cdot W)\,\Phi_{xx}|_{x=L} + \left(\Phi_{yx}|_{y}\right)(L \cdot W) - (L \cdot W)\,\Phi_{yx}|_{y+\Delta y} = 0$$

Dividing by $\Delta y WL$ & taking limits $\Delta y \to 0$.

$$\therefore \frac{d}{dy}(\Phi_{yx}) = \frac{\Phi_{xx}|_{x=0} - \Phi_{xx}|_{x=L}}{L}$$

$$\rho \frac{du_x}{dt} = f(x) + \tau_{xx}^{\to 0} + \nabla u_x^2$$

$$\tau_{yx} = 0 + \mu \frac{du_x}{dy}\Big|_{x=0}$$

$$\therefore \frac{d}{dy}\left(-\mu \frac{du_x}{dy}\right) = \frac{P|_{x=0} - P|_{x=L}}{L}$$

Integrating, we get.

$$-\mu \frac{du_x}{dy} = \left[\frac{P_0 - P_L}{L}\right] y + C_1$$

at $y = 0 \quad \tau_{yx} = 0.$

$$\Rightarrow C_1 = 0.$$

$$\therefore -\mu \frac{du_x}{dy} = \left[\frac{P_0 - P_L}{L}\right] y.$$

$$\therefore \frac{+du_x}{dy} = \frac{P_0 - P_L}{-\mu L} \cdot y$$

Integrating we get

$$u_x = \frac{P_0 - P_L}{-\mu L} \frac{y^2}{2} + C_2.$$

At $y = \pm B$, $u_x = 0.$

$$\Rightarrow C_2 = \left[\frac{-P_0 - P_L}{-2\mu L}\right] B^2$$

$$\therefore \boxed{u_x = \left[\frac{P_0 - P_L}{2\mu L}\right] B^2 \left[1 - \left(\frac{y}{B}\right)^2\right]}$$

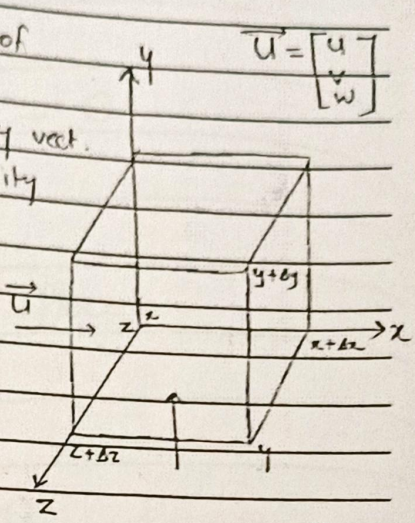
Velocity profile inside an horizontal tube.

Q4

→ Consider a rectangular element of space

The components of fluid velocity vect. $\vec{U}$ are u, v & w and density of fluid ρ.

The volume of element $= \Delta x \Delta y \Delta z$.



Applying mass balance over the element.

(Rate of mass in at x, y, z) − (Rate of mass out at x+Δx, y+Δy & z+Δz) + (Rate of mass generated or consumed) = (Rate of mass accumulated) — ①

Diff

$\therefore$ (Rate of mass in) $= \Delta y \Delta z (\rho u)|_x + \Delta x \Delta z (\rho v)|_y + \Delta x \Delta y (\rho w)|_z$

Rate of mass out $= \Delta y \Delta z (\rho u)|_{x+\Delta x} + \Delta x \Delta z (\rho v)|_{y+\Delta y} + \Delta x \Delta y (\rho w)|_{z+\Delta z}$

Rate of mass accumulated $= \frac{dM}{dt} = \frac{d(\rho V)}{dt} = (\Delta x \Delta y \Delta z)\frac{d\rho}{dt}$

Substituting in ①.

$$[\Delta y \Delta z (\rho u)|_x + \Delta x \Delta z (\rho v)|_y + \Delta x \Delta y (\rho w)|_z] - [\Delta z \Delta y (\rho u)|_{x+\Delta x} + \Delta z \Delta x (\rho v)|_{y+\Delta y} + \Delta x \Delta y (\rho w)|_{z+\Delta z}] = (\Delta x \Delta y \Delta z)\frac{d\rho}{dt}$$

$$\therefore \frac{(\rho u)|_{x+\Delta x} - (\rho u)|_x}{\Delta x} + \frac{(\rho v)|_{y+\Delta y} - (\rho v)|_y}{\Delta y} + \frac{(\rho w)|_{z+\Delta z} - (\rho w)|_z}{\Delta z} + \frac{d\rho}{dt}$$

$$\therefore \boxed{\frac{d\rho}{dt} + \frac{\partial(\rho u)}{\partial x} + \frac{\partial(\rho v)}{\partial y} + \frac{\partial(\rho w)}{\partial z}} = 0$$ General eqn. of continuity

Special Case:

1) for steady flow.

$$\frac{\partial \rho}{\partial t} = 0$$

$$\Rightarrow \frac{\partial(\rho u)}{\partial x} + \frac{\partial(\rho v)}{\partial y} + \frac{\partial(\rho w)}{\partial z} = 0.$$

2) for steady & incompressible flow.

ρ = constant.

$$\Rightarrow \frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} = 0.$$

3) for compressible fluids:

$$\frac{1}{\rho}\left[\frac{D\rho}{Dt}\right] + \frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} = 0.$$

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name Aamod Rajurkar Roll No.: 19CH038

Subject PMS Division : B.E CHEMICAL

Examination Unit Test - 1 Day & Date : 9.3.2023

Question No.	1	2	3	4	5	6	7	8	9	10	Total Marks
Marks											14/15

Examiner Signature

Q.1.)

→ a) Modeling & Simulation -

Expressing a process in terms of mathematical equations to achieve desired output of the actual process is called modeling.

Types of Models :

i.) Linear & Non-linear models

ii.) Steady & Unsteady models

iii.) Lumped parameter & distributed parameter model

iv.) State space model & transform domain model.

(0.5) Simulation - Testing of mathematical models/equations using a computer program or software or by analytical method is called simulation.

b) Lumped Parameter Model -

Lumped parameter model means that special variations are ignored & the various properties & the state of system can be considered homogenous throughout the entire system.

Eg.) Consider a perfectly insulated stirred tank where a hot liq. steam at 50°C is mixed with a

cold liq. stream at 10°C. The well mixed assumption means the fluid temp. in tank is uniform & equal to the exit from tank, since the temp. does not vary with position.

c) Distributed Parameter System -
A distributed parameter system takes into account detailed variations in behaviour from point to point throughout the system. All systems are of course, distributed as there are some variations throughout them. Many times the variations are very small, so they may be ignored & system can be treated as the 'lumped system'.

d) State space model -
State space models are models that use state variables to describe a system by a set of 1st order differential equations, rather than by one or more nth order differential eqn.
If the set of 1st order differential equation is linear in the state & input variables, the model is referred to as a linear space state model.

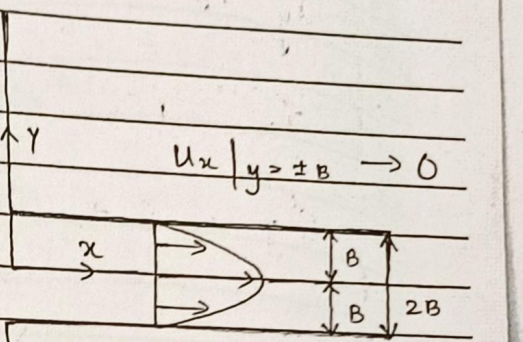
e) Degree of Freedom -
Degree of freedom is defined as each of a number of independently variable factors affecting the range of states in which a system may exist, in particular any of the directions in which independent motion can occur.

Q.3.) Process → Physical process

By applying law of conservation of momentum

Input − Output + Generation − Consumption = Accⁿ

Input = Output



$u_x = f(y)$

$u_y = 0$ $\quad u_x|_{y=0} \to max$

$u_z = 0$

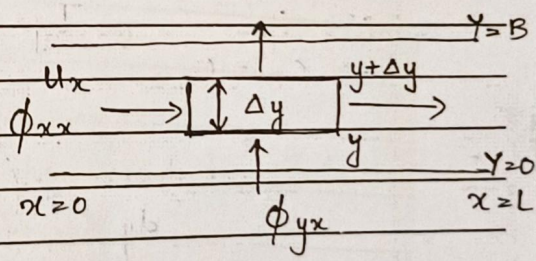
Assumptions: 1.) 1-D flow

2.) Steady state flow

3.) Physical properties const.

4.) Incompressible & isothermal

$u_x = f(y)$; $u_y = u_z = 0$



(05) Model Deviation:

Rate of momentum in $= \left(\phi_{xx}|_{x=0}\right)(\Delta y \cdot W) + \left(\phi_{yx}|_{y}\right)(LW)$

Rate of momentum out $= \left(\phi_{xx}|_{x=L}\right)(\Delta y \cdot W) + \left(\phi_{yx}|_{y+\Delta y}\right)(L \cdot W)$

By law of conservation of momentum

(ROM in) − (ROM out) = 0

$(\Delta y\, W)\left(\phi_{xx}|_{x=0}\right) - (\Delta y \cdot W)\left(\phi_{xx}|_{x=L}\right) + \left(\phi_{yx}|_{y}\right)(L \cdot W) - \left(\phi_{yx}|_{y+\Delta y}\right)(LW)$

Dividing by $\Delta y \cdot W \cdot L$ & taking limits at $\Delta y \to 0$

$$\frac{d}{dy}(\phi_{yx}) = \frac{\phi_{xx}|_{x=0} - \phi_{xx}|_{x=L}}{L}$$

$$\phi_{xx} = P(x) + \tau_{xx} + \rho u_x^2$$

$$\phi_{yx} = 0 + \mu \frac{du_x}{dy} + 0$$

$$\therefore \frac{d}{dy}\left(-\mu \frac{du_x}{dy}\right) = \frac{P|_{x=0} - P|_{x=L}}{L}$$

Integrating, we get

$$-\mu \frac{du_x}{dy} = \left[\frac{P_0 - P_L}{L}\right] y + C_1$$

at $y = 0$; $\tau_{yx} = 0$

$\Rightarrow C_1 = 0$

$$\therefore -\mu \frac{du_x}{dy} = \left(\frac{P_0 - P_L}{L}\right) y$$

$$\frac{du_x}{dy} = \frac{P_0 - P_L}{-\mu L} \cdot y$$

Integrating we get

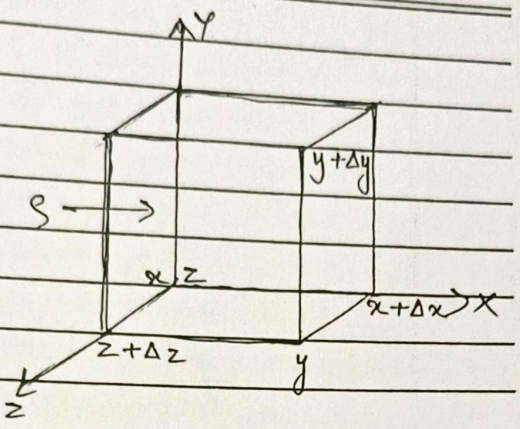
$$u_x = \frac{P_0 - P_L}{-\mu L} + C_2$$

At $y = \pm B$; $u_x = 0$

$$C_2 = \left(\frac{-P_0 - P_L}{-2\mu L}\right) B^2$$

$$u_x = \left(\frac{P_0 - P_L}{2\mu L}\right) B^2 \left(1 - \left[\frac{y}{B}\right]^2\right)$$

Q.4.) Continuity Eqn.



Mass balance:

(Rate of mass in at x, y, z) − (Rate of mass out at $x+\Delta x, y+\Delta y, z+\Delta z$) = (Rate of mass accumulated)

$$(\rho u)|_x \Delta y \Delta z + \Delta x \Delta z (\rho v)|_y + \Delta x \Delta y (\rho w)|_z$$

$$- \Delta y \Delta z (\rho u)|_{x+\Delta x} - \Delta x \Delta z (\rho v)|_{y+\Delta y} - \Delta x \Delta y (\rho w)|_{z+\Delta z}$$

$$= \frac{dm}{dt} = \frac{d(\rho V)}{dt}$$

$$= \frac{d\rho (\Delta x \Delta y \Delta z)}{dt}$$

$$\frac{(\rho u)|_{x+\Delta x} - (\rho u)|_x}{\Delta x} + \frac{(\rho v)_{y+\Delta y} - (\rho v)|_y}{\Delta y}$$

$$+ \frac{(\rho w)|_{z+\Delta z} - (\rho w)|_z}{\Delta z} + \frac{d\rho}{dt} = 0$$

By taking limits we get

$$\frac{d\rho}{dt} + \frac{d(\rho u)}{dx} + \frac{d(\rho v)}{dy} + \frac{d(\rho w)}{dz} = 0$$

$$D(\rho \vec{u}) = 0$$

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name Sumeet Pardeshi Roll No.: 19CH034

Subject PMS Division : BE Chemical

Examination Test-1 Day & Date : Thursday 9/3/23

Question No.	1	2	3	4	5	6	7	8	9	10	Total Marks
Marks											11.5/15

Examiner Signature

1)

→ a) Modeling & simulation

Expressing a process in terms of mathematical equations to achieve desired output of the actual real life process is called as modeling.

Types of model (i) Linear & Non linear model (ii) Steady & unsteady models (iii) Lumped parameter & distributed parameter model.

(iv) State space model & transform domain models.

Simulation - testing of mathematical models / equations using a computer program or software. or by analytics method is called Simulation.

b) Lumped parameter models:

Lumped parameter representation means that special variation are ignored & the various properties and the state of system can be considered homogeneous throughout the entire system

Eg. Consider a perfectly insulated stirred tank where a hot liq stream at 50°C is mixed with a cold liq stream at 10°C the

well mixed assumption means that the fluid temp in tank is uniform & equal to the exit from tank since the temp does not vary with position.

c) Distributed Parameter System.

A distributed parameter system takes into account detailed variation in behaviour from point to point throughout the system. All system are of course distributed as there are some of HEX & is heated by energy transfered from condensing steam stream. This is distributed parameter sys as the temp of water is changing with time & portion.

d) State Space model.

State space models are models that use state variables to describe a system by a set of 1st order differential equations rather than by one or more nth order differential eqn.

If the set of 1st order differential equation is linear in the state & input variables, the model is referred to as a linear space state model.

e) Degree of freedom

Degree of freedom is defined as each of a number of independently variable factors affecting the range of states in which a system may exist, in particular any of the direction in which independent motion can occur.

well mixed assumption means that the fluid temp in tank is uniform & equal to the exit from tank since the temp does not vary with position.

c) Distributed Parameter System.

A distributed parameter system takes into account detailed variation in behaviour from point to point throughout the system. All system are of course distributed as there are some of HEX & is heated by energy transfered from condensing steam stream. This is distributed parameter sys as the temp of water is changing with time & portion.

d) State Space model.

State space models are models that use state variables to describe a system by a set of 1st order differential equations rather than by one or more nth order differential eqn.

If the set of 1st order differential equation is linear in the state & input variables, the model is referred to as a linear space state model.

e) Degree of freedom

Degree of freedom is defined as each of a number of independently variable factors affecting the range of states in which a system may exist, in particular any of the direction in which independent motion can occur.

5.

→ Process → Physical process.

- By Applying law of Conservation of Momentum.

Input - Output + Generation - Consumption = Accumulation

→ Input = Output

- Assumption 1) 1-D flow
2) Steady state flow
3) Physical properties const
4) Incompressible & Isothermal

$u_x = f(y)$, $v_y = v_z = 0$

- Model Derivation :

Rate of Momentum in $= (\phi_{xx}|_{x=0})(\Delta y\, w) + (\phi_{yx}|_{y})(1 \cdot w)$

Rate of Momentum out $= (\phi_{xx}|_{x=L})(\Delta y \cdot w) + (\phi_{yx}|_{y+\Delta y})(L w)$

By Law of conservation of momentum.

∴ (Rate of momentum in) − (Rate of momentum out) = 0.

$(\Delta y\, w)(\phi_{xx}|_{x=0}) - \Delta y\, \phi_{xx}|_{x=L} + (\phi_{yx}|_{y})(Lw) - (Lw)\phi_{yx}|_{y+\Delta y} = 0.$

Dividing by $\Delta y\, wL$ & taking limits $\Delta y \to 0$

$$\frac{d}{dy}(\phi_{yx}) = \frac{\phi_{xx}|_{x=0} - \phi_{xx}|_{x=L}}{L}$$

$$\phi_{xx} = p(x) + \tau_{xx}^{0} + \rho v_x^2$$

$$\phi_{yx} = 0 + \mu \frac{dv_x}{dy} \quad \text{to}$$

$$\frac{d}{dy}\left(-\mu \frac{dv_x}{dy}\right) = \frac{P|_{x=0} - P|_{x=L}}{L}$$

Integrating, we get

$$-\mu \frac{dv_x}{dy} = \left[\frac{P_0 - P_L}{L}\right] y + C_1$$

at $y = 0 \quad \tau_{yx} = 0$

$\Rightarrow C_1 = 0$

$$-\mu \frac{dv_x}{dy} = \left[\frac{P_0 - P_L}{L}\right] \cdot y$$

$$\therefore + \frac{dv_x}{dy} = \frac{P_0 - P_L \cdot y}{-\mu L}$$

Integrating we get

$$v_x = \frac{P_0 - P_L}{-\mu L} \frac{y^2}{2} + C_2$$

At $y = \pm B$, $v_x = 0$.

$$\Rightarrow C_1 = \left[\frac{P_0 - P_L}{-2\mu L}\right] B^2$$

$$\boxed{v_x = \left[\frac{P_0 - P_L}{2\mu L}\right] B^2 \left[1 - \left(\frac{y}{B}\right)^2\right]}$$

Velocity profile inside a horizontal tube.

Sol 7. Law of Conservation

a) Continuity Eqn / mass Conservation:

Eq of Continuity : $\frac{\partial \rho}{\partial t} + \frac{\partial(\rho u)}{\partial x} + \frac{\partial(\rho v)}{\partial y} + \frac{\partial(\rho w)}{\partial z} = 0$

dynamic term

Convection / Advection term

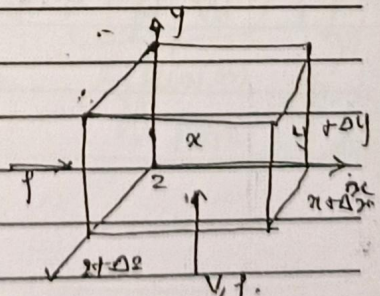
Velocity Vel

$$\vec{u} = \begin{bmatrix} u \\ v \\ w \end{bmatrix}$$

∴ Mass balance

(Rate of mass in at x, y, z) − (Rate of mass out at $x+\Delta x, y+\Delta y, z+\Delta z$) ± (Rate of mass generated or consumed)

= (Rate of mass accumulated / depleted).



$$(\Delta y \Delta z (\rho u)|_x + \Delta x \Delta z (\rho v)|_y + \Delta x \Delta y (\rho w)|_z) - \Delta y \Delta z (\rho u)|_{x+\Delta x} + \Delta x \Delta z (\rho v)|_{y+\Delta y} + \Delta x \Delta y (\rho w)|_{x+\Delta z}$$

$$= \frac{du}{dt} = \frac{d(\rho v)}{dt} = \frac{d\rho}{dt} (\Delta x \Delta y \Delta z)$$

$$\frac{(\rho u)|_{x+\Delta x} - (\rho u)|_x}{\Delta x} + \frac{(\rho v)|_{y+\Delta y} - (\rho v)|_y}{\Delta y} + \frac{(\rho w)|_{z+\Delta x} - (\rho w)|_x}{\Delta x} + \frac{d\rho}{dt} = 0$$

By taking limit we get

$$\frac{\partial \rho}{\partial t} + \frac{\partial(\rho u)}{\partial x} + \frac{\partial(\rho v)}{\partial y} + \frac{\partial(\rho w)}{\partial z} = 0$$

eq^n of Continuity

$$\Rightarrow \frac{D}{Dt}(\rho \vec{u}) = 0$$

This eqn can be applied to.

1) Steady State / Unsteady State
2) Compressible flow / Incompressible flow.
3) 1-D / 2-D / 3-D flow

2) Navier Stokes eqn / Momentum Balance eqn.

$$\frac{\partial}{\partial t}(\rho \vec{u}) + \nabla(\rho \vec{v} \cdot \vec{u}) = -\nabla \cdot p + \nabla(\mu \cdot v\vec{u}) + \rho \vec{g}$$

- $\frac{\partial}{\partial t}(\rho \vec{u})$: unsteady state term.
- $\nabla(\rho \vec{v} \cdot \vec{u})$: convection term.
- $-\nabla \cdot p$: Diffusion term
- $\nabla(\mu \cdot v\vec{u})$: Diffusion term
- $\rho \vec{g}$: Body force

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name Sumer Pardeshi Roll No.: 19CH034

Subject PMS Division : BE Chemical

Examination Test-1 Day & Date : Thursday 9/3/23

Question No.	1	2	3	4	5	6	7	8	9	10	Total Marks
Marks											11.5/15

Examiner Signature

1)

→ a) Modeling & simulation

Expressing a process in terms of mathematical equations to achieve desired output of the actual real life process is called as modeling.

Types of model (i) Linear & non linear model (ii) Steady & unsteady models (iii) Lumped parameter & distributed parameter model.

(iv) State space model & transform domain models.

Simulation - testing of mathematical models / equations using a computer program or software or by analytics method is called simulation.

b) Lumped parameter model:

Lumped parameter representation means that special variation are ignored & the various properties and the state of system can be considered homogenous throughout the entire system

Eg. Consider a perfectly insulated stirred tank where a hot liq stream at 50°C is mixed with a cold liq stream at 10°C. The

well mixed assumption means that the fluid temp in tank is uniform & equal to the exit from tank since the temp does not vary with position.

c) Distributed Parameter System.
A distributed parameter system takes into account detailed variation in behaviour from point to point throughout the system. All system are of course distributed as there are some of HEX & is heated by energy transfered from condensing steam stream. This is distributed parameter sys as the temp of water is changing with time & portion.

d) State Space model.
State space models are models that use state variables to describe a system by a set of 1st order differential equations rather than by one or more nth order differential eqn.
If the set of 1st order differential equation is linear in the state & input variables, the model is referred to as a linear space state model.

e) Degree of freedom
Degree of freedom is defined as each of a number of independently variable factors affecting the range of states in which a system may exist. In particular any of the direction in which independent can occur.

Q1.

→ Process → Physical process.

- By Applying law of Conservation of Momentum.

Input - Output + Generation - Consump = Accld

→ Input = Output

- Assumption 1) 1-D flow
2) Steady state flow
3) Physical properties const
4) Incompressible & Isothermal

$u_x = f(y)$, $v_y = v_z = 0$

- Model Derivation

Rate of momentum in $= (\phi_{xx}|_{x=0})(\Delta y\, w) + (\phi_{yx}|_{y})(1 \cdot w$

Rate of momentum out $= (\phi_{xx}|_{x=L})(\Delta y\, w) + (\phi_{yx}|_{y+\Delta y})(L$

By law of conservation of momentum.

∴ (Rate of momentum in) − (Rate of momentum out) = 0.

$(\Delta y\, w)(\phi_{xx}|_{x=0}) - \Delta y\, \phi_{xx}|_{x=L} + (\phi_{yx}|_{y})(\lambda w) - (\lambda w)\phi_{yx}|_{y+\Delta y}$

$= 0.$

Dividing by $\Delta y\, w L$ & taking limits $\Delta y \to 0$

$$\frac{d}{dy}(\phi_{yx}) = \frac{\phi_{xx}|_{x=0} - \phi_{xx}|_{x=L}}{L}$$

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Accredited by NAAC with "A+" Grade

Department of Civil Engineering

VISION:-Nurture the talent in Civil Engineers to work as global leaders for development of society.

Date: - 06.10.2022

SE Un
Time-1

NOTICE

SE Civil
Academic Year 2022-23

Unit Test No. 1
Time Table

Sr. No.	Subject	Date	Time
1	Building Tech. & Arch. Plan	10.10.2022	8.30 am to 9.45 am
2	Mechanics of Structure	11.10.2022	8.30 am to 9.45 am
3	Fluid Mechanics	12.10.2022	8.30 am to 9.45 am
4	Engineering Mathematics III	13.10.2022	8.30 am to 9.45 am
5	Engineering Geology	14.10.2022	8.30 am to 9.45 am

Kashid

Ms. K D Kashid
Deptt. Exam Coordinator

Dr. P B Nangare
Head of Department

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

Date: - 18.08.2022

Unit test 1 Timetable

NOTICE

TE & BE Civil
Academic Year 2022-23

Unit Test No. 1
Time Table

Sr. No.	Class	Subject	Date	Time
		TE Civil		
1	TE Civil	Hydrology and Water Resources Engineering	22.08.2022	8.30 am to 9.45 am
2	TE Civil	Water Supply Engineering	23.08.2022	8.30 am to 9.45 am
3	TE Civil	Engineering Economics and Financial Mgmt	24.08.2022	8.30 am to 9.45 am
4	TE Civil	Design of Steel Structures	25.08.2022	8.30 am to 9.45 am
5	TE Civil	Construction Management (Elec. I)	26.08.2022	8.30 am to 9.45 am
		BE Civil		
1	BE Civil	Foundation Engineering	22.08.2022	8.30 am to 9.45 am
2	BE Civil	Operation Research (Elec. III)	23.08.2022	8.30 am to 9.45 am
3	BE Civil	Coastal Engineering (Elec. III)	23.08.2022	8.30 am to 9.45 am
4	BE Civil	SACM (Elec. IV)	24.08.2022	8.30 am to 9.45 am
5	BE Civil	Air Pollution and Control (Elec. IV)	24.08.2022	8.30 am to 9.45 am
6	BE Civil	Transportation Engineering	25.08.2022	8.30 am to 9.45 am

Ms. K D Kashid
Deptt. Exam Coordinator

Dr. P B Nangare
Head of Department

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

AISSMS
COLLEGE OF ENGINEERING

ज्ञानगङ्गा सर्वजनहिताय

Accredited by NAAC with "A+" Grade

Department of Civil Engineering

VISION:-Nurture the talent in Civil Engineers to work as global leaders for development of society.

Date: - 02.12.2022

NOTICE

SE Civil
Academic Year 2022-23

Unit Test No. 2
Time Table

Sr. No.	Subject	Date	Time
1	Building Tech. & Arch. Plan	05.12.2022	8.30 am to 9.45 am
2	Mechanics of Structure	06.12.2022	8.30 am to 9.45 am
3	Fluid Mechanics	07.12.2022	8.30 am to 9.45 am
4	Engineering Mathematics III	08.12.2022	8.30 am to 9.45 am
5	Engineering Geology	09.12.2022	8.30 am to 9.45 am

Ms. K D Kashid
Deptt. Exam Coordinator

Dr. P B Nangare
Head of Department

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

AISSMS
COLLEGE OF ENGINEERING

Department of Civil Engineering

VISION:-Nurture the talent in Civil Engineers to work as global leaders for development of society.

Date:- 14.10.2022

NOTICE

TE & BE Civil
Academic Year 2022-23

Unit Test No. 2
Time Table

Sr. No.	Class	Subject	Date	Time
		TE Civil		
1	TE Civil	Hydrology and Water Resources Engineering	17.10.2022	8.30 am to 9.45 am
2	TE Civil	Water Supply Engineering	18.10.2022	8.30 am to 9.45 am
3	TE Civil	Engineering Economics and Financial Mgmt	19.10.2022	8.30 am to 9.45 am
4	TE Civil	Design of Steel Structures	20.10.2022	8.30 am to 9.45 am
5	TE Civil	Construction Management (Elec. I)	21.10.2022	8.30 am to 9.45 am
		BE Civil		
1	BE Civil	Foundation Engineering	17.10.2022	8.30 am to 9.45 am
2	BE Civil	Operation Research (Elec. III)	18.10.2022	8.30 am to 9.45 am
3	BE Civil	Coastal Engineering (Elec. III)	18.10.2022	8.30 am to 9.45 am
4	BE Civil	SACM (Elec. IV)	19.10.2022	8.30 am to 9.45 am
5	BE Civil	Air Pollution and Control (Elec. IV)	19.10.2022	8.30 am to 9.45 am
6	BE Civil	Transportation Engineering	20.10.2022	8.30 am to 9.45 am

Ms. K D Kashid
Deptt. Exam Coordinator

Dr. P B Nangare
Head of Department

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

Mission: - M1: Provide quality education to develop competent Civil Engineers.
M2: Create awareness among students for sustainable development.
M3: Cultivate the leadership qualities for becoming successful entrepreneurs.

Date: - 21.03.2023

NOTICE

SE Civil
Academic Year 2022-23

Unit Test No. 1
Time Table

Sr. No.	Class	Subject	Date	Time
1	SE Civil	Geotechnical Engineering	27.03.2023	8.30 am to 9.30 am
2	SE Civil	Surveying	28.03.2023	8.30 am to 9.30 am
3	SE Civil	Concrete Technology	29.03.2023	8.30 am to 9.30 am
4	SE Civil	Structural Analysis	30.03.2023	8.30 am to 9.30 am
5	SE Civil	Project Management	31.03.2023	8.30 am to 9.30 am

Ms. K D Kashid
Deptt. Exam Coordinator

Dr. P B Nangare
Head of Department

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

AISSMS
COLLEGE OF ENGINEERING
ज्ञानगङ्गा राकलजनहिताय
Accredited by NAAC with "A+" Grade

Department of Civil Engineering
VISION:-Nurture the talent in Civil Engineers to work as global leaders for development of society.

Date: - 03.03.2023

NOTICE

TE & BE Civil
Academic Year 2022-23

Unit Test No. 1
Time Table

Sr. No.	Class	Subject	Date	Time
		TE Civil		
1	TE Civil	Waste Water Engineering	06.03.2023	8.30 am to 9.30 am
2	TE Civil	Remote Sensing and GIS	07.03.2023	8.30 am to 9.30 am
3	TE Civil	Architecture and Town Planning (Elec. II)	08.03.2023	8.30 am to 9.30 am
4	TE Civil	Solid Waste Management (Elec. II)	08.03.2023	8.30 am to 9.30 am
5	TE Civil	Design of RC Structures	09.03.2023	8.30 am to 9.30 am
		BE Civil		
1	BE Civil	Dams and Hydraulics Structures	06.03.2023	8.30 am to 9.30 am
2	BE Civil	Quantity Surveying, Contracts and Tenders	07.03.2023	8.30 am to 9.30 am
3	BE Civil	Hydropower Engineering (Elec. V)	08.03.2023	8.30 am to 9.30 am
4	BE Civil	Green Structures and Smart Cities (Elec. VI)	09.03.2023	8.30 am to 9.30 am

Ms. K D Kashid
Deptt. Exam Coordinator

Dr. P R Nangare
Head of Department

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

AISSMS
COLLEGE OF ENGINEERING

ज्ञानम् सकलजनहिताय

Accredited by NAAC with "A+" Grade

Department of Civil Engineering

VISION:-Nurture the talent in Civil Engineers to work as global leaders for development of society.

Date: -13.05.2023

NOTICE

SE Civil

Academic Year 2022-23

Unit Test No. 1

Time Table

Sr. No.	Class	Subject	Date	Time
1	SE Civil	Geotechnical Engineering	15.05.2023	3.30 pm to 4.30 pm
2	SE Civil	Surveying	17.05.2023	3.30 pm to 4.30 pm
3	SE Civil	Concrete Technology	18.05.2023	3.30 pm to 4.30 pm
4	SE Civil	Structural Analysis	19.05.2023	3.30 pm to 4.30 pm
5	SE Civil	Project Management	22.05.2023	3.30 pm to 4.30 pm

Note: All students are informed to report unit test 2 paper at 3.00pm sharp.

Ms. K D Kashid
Deptt. Exam Coordinator

Dr. P B Nangare
Head of Department

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Accredited by NAAC with "A+" Grade

Department of Civil Engineering
VISION:-Nurture the talent in Civil Engineers to work as global leaders for development of society.

Date: -21.04.2023

NOTICE

TE & BE Civil
Academic Year 2022-23

Unit Test No. 2
Time Table

Sr. No.	Class	Subject	Date	Time
		TE Civil		
1	TE Civil	Waste Water Engineering	24.04.2023	3.30 pm to 4.30 pm
2	TE Civil	Remote Sensing and GIS	25.04.2023	3.30 pm to 4.30 pm
3	TE Civil	Architecture and Town Planning/ Solid Waste Management (Elec. II)	26.04.2023	3.30 pm to 4.30 pm
4	TE Civil	Design of RC Structures	27.04.2023	3.30 pm to 4.30 pm
		BE Civil		
1	BE Civil	Dams and Hydraulics Structures	24.04.2023	3.30 pm to 4.30 pm
2	BE Civil	Quantity Surveying, Contracts and Tenders	25.04.2023	3.30 pm to 4.30 pm
3	BE Civil	Hydropower Engineering (Elec. V)	26.04.2023	3.30 pm to 4.30 pm
4	BE Civil	Green Structures and Smart Cities (Elec. VI)	27.04.2023	3.30 pm to 4.30 pm

Note: All students are informed to report unit test 2 paper at 3.00 pm sharp.

Ms. K D Kashid
Deptt. Exam Coordinator

Dr. P B Nangare
Head of Department

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name Devayani S. Gurap Roll No.: 20CV041

Subject Design of Reinforced Concrete structures Division : TE Civil A

Examination Unit Test-2. Day & Date : 27/04/22, Thursday

Question No.	1	2	3	4	5	6	7	8	9	10	Total Marks
Marks		13		11							24

Examiner Signature

230 X 450

Q.2)

Step 1: Calculate Max^m ultimate shear.

$V_{umax} = \frac{W_u L}{2} = \frac{50 \times 5.3}{2} = 132.5$ ~~125~~ KN

Step 2: Compute design shear V_{ud}

$V_{ud} = V_{umax} - W_u\left(\frac{b_c}{2} + d\right)$

$= 132.5 - 50\left(\frac{0.3}{2} + 0.422\right)$

$= 103.8$ KN

$d = 450 - 20 - \frac{16}{2}$

$d = 422$

Step 3: Max^m allowable ultimate shear (V_{ucmax})

$V_{ucmax} = \tau_{cmax} \times b \times d$

$= 2.8 \times 230 \times 422$

$= 271.76$ KN $> V_{ud} = 103.8$ KN

13

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

Step 4: Shear resisted by concrete.

$V_{uc} = \tau_{uc} b d$

$P_t = \frac{100 A_{st}}{bd}$; $A_{st} = 2 \times \frac{\pi}{4} \times (16)^2 = 402.12$

$= \frac{100 \times 402.12}{230 \times 422} = 0.414\%$

$V_{uc} = \tau_{uc} b d$

Now, $P_t = 0.414\%$, M20 grade

Refer Table 19, $\tau_{uc} = 0.44\ N/mm^2$

$V_{uc} = 0.44 \times 230 \times 422 = \underline{42.71\ KN}$

Step 5: $V_{us\,min}$

$V_{us\,min} = 0.4\,bd$

$= 0.4 \times 230 \times 422$

$= \underline{38.82\ KN}$

Step 6: $V_{u\,min}$

$V_{u\,min} = V_{uc} + V_{us\,min}$

$= 42.71 + 38.82$

$= \underline{81.53\ KN} < V_{uD} = 103.8\ KN$

Step 7: Design shear reinforcement

$V_{us} = V_{uD} - V_{uc}$

$= 103.8 - 42.71$

$= 61.09\ KN$

Use 2 legged # 8 mm stirrups

$S = \dfrac{0.87 f_y A_{sv} d}{V_{us}}$

$= \dfrac{0.87 \times 415 \times 100.53 \times 422}{61.09 \times 10^3}$

$A_{sv} = \dfrac{2 \times \pi \times (8)^2}{4}$

$= 100.53\ mm^2$

$= 250.729$

$\therefore S = 250$ mm c/c

Provide 8 mm stirrups → 2 legged at 250 mm c/c.

HI... DEPARTMENT
AISS... GINEERING
COE, PUNE-1.

Step 8: Zones: Zone 1:

i) $L_{s1} = \frac{V_{umax} - V_{umin}}{W_u} = \frac{132.5 - 81.53}{50} = 1.019\ m$

$= 1019\ mm$

Provide 8 mm # stirrups @ 250 mm c/c.

∴ Provide 4 stirrups as. No. of stir $= \frac{1019}{250} = 4$

∴ Provided $L_{s1} = \frac{300}{2} + 50 + 3 \times 250 = 950\ mm$

ii) Zone 2:

$L_{s2} = \frac{L}{2} - L_{s1\,prov} - L_{s3} =$

$L_{s3} = \frac{0.5\,V_{uc}}{W_u} = \frac{0.5 \times 42.71}{50} = 0.427 = 427\ mm$

∴ $L_{s2} = \frac{5300}{2} - 950 - 427 = 1273\ mm$

Provide 8 mm # stirrups.

$S = \frac{0.87 f_y A_{sv}}{0.4 b} = \frac{0.87 \times 415 \times 100.53}{0.4 \times 230} = 394.52\ mm$

Provide 8 mm # @ 350 mm c/c.

No. of stirrups $= \frac{1273}{350} = 3.63 = 4$ Nos.

L_{s2} provided $= \overset{3}{\cancel{4}} \times 350 = 1050\ mm$

iii) Zone 3:

$L_{s3} = \frac{L}{2} - L_{s1\,prov} - L_{s2\,prov} = \frac{5300}{2} - 950 - 1050$

$= 650\ mm$

Provide nominal shear 6 mm ϕ @ 300 mm c/c.

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

(b) Formation of plastic hinges :

→ When the load is gradually increased beyond the service load, the moment at critical section reaches the plastic moment and plastic hinge is formed.

→ If the load is further increased beyond the resisting moment capacity, the plastic hinges start to rotate at the section.

→ The section then transfers load to other section, if the applied loads are further increased. This phenomenon is called redistribution of moments.

* Purpose of redistribution of moment

→ It reduces the support moment and hence absolute max. design moment. Therefore, reduces either the cross section or the area of steel at support and thus avoids congestion of steel at support.

05

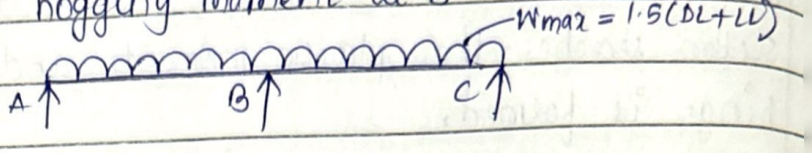
→ RC beam cast monolithically with the slab normally acts as flange beam at midspan and rectangular beam at support. So, therefore, reduction of support moment and increasing the span moment is advantageous for better utilization & higher moment of resistance of flange section at midspan.

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

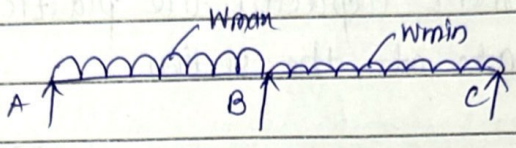
Loading Case :

1) Load Case for 2 span continuous beam

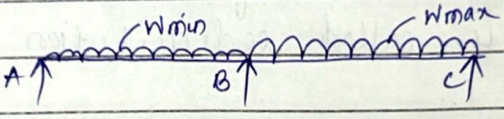
Case I: Maxm hogging moment at B



Case II: Maxm sagging moment in AB

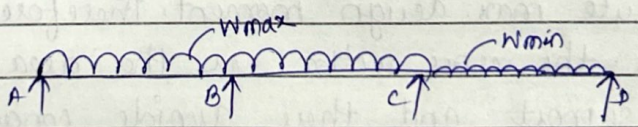


Case III: Maxm sagging moment in BC

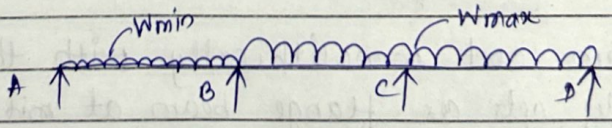


2) Load case for 3 span continuous beam :

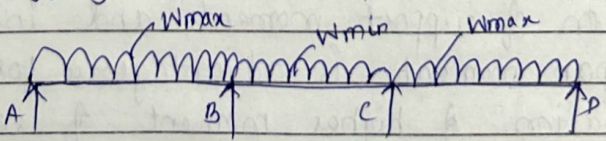
Case I: Maxm Hogging moment at B



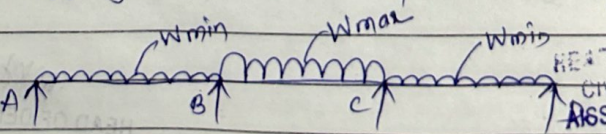
Case II: Maxm Hogging moment at C



Case III: Maxm Sagging moment in span AB and CD



Case IV: Maxm sagging moment in span BC



HEAD OF DEPARTMENT
CIVIL ENGINEERING
SSMS's COE, PUNE-1.

6) 1) Design parameter

$k_{umax} = 0.48$

$R_{umax} = 0.36 f_{ck} k_{umax} (1 - 0.42 k_{umax})$

$= 0.36 \times 20 \times 0.48 (1 - 0.42 \times 0.48)$

$R_{umax} = 2.76 \ N/mm^2$

$$P_{tmax} = \frac{0.36 f_{ck} k_{umax}}{0.87 f_y}$$

$$= \frac{0.36 \times 20 \times 0.48}{0.87 \times 415}$$

$P_{tmax} = 0.0095$

2) Assume 230 mm width of beam

$$d = \sqrt{\frac{M_u}{R_{umax} \times b}}$$

$$d = \sqrt{\frac{62 \times 10^6}{2.76 \times 230}} = 312.52 \text{ mm}$$

$d \approx 315$ mm

3) $A_{st} = P_{tmax} \times b \times d$

$= 0.0095 \times 230 \times 315$

$= 688.27 \ mm^2 \approx 690 \ mm^2$

Provide 20 mm #

No. of bars $= \frac{690}{\frac{\pi}{4} \times (20)^2}$

$= 2.19$

Provide 3-20 mm #

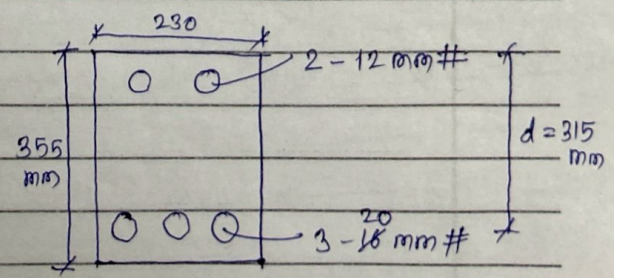
4) $D = d' + d$

$d' = 40$ mm .... Assume

$D = 40 + 315$

$D = 355$ mm

06



HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

AISSMS
COLLEGE OF ENGINEERING

ज्ञानम् सकलजनहिताय

Accredited by NAAC with "A+" Grade

DEPARTMENT OF CIVIL ENGINEERING

UNIT TEST- 2 A.Y. 2022-23 TERM-II

Class:TE (CivilEngineering) Semester: VI
Subject:Design of Reinforced Concrete Structures Pattern: TE (2019 Course)
Maximum Marks: 30 Duration:1 hour
Time:3.30p.m. to 4.30p.m. Date:27/04/2023

Instruction for the students:

*1) Answer **Q1 or Q2; Q3 or Q4.***
2) Figures to the right indicates full marks.
*3) Use of **IS 456-2000** is allowed.*
4) If necessary, assume suitable data and indicates clearly.
5) Mere reproduction from is code as answer, will not be given full credit.

Course Outcome Statements:
CO3: Design & detailing of rectangular one way and two-way slab with different boundary conditions
CO4: Design & detailing of dog legged and open well staircase

Taxonomy Levels:
I-Remember, II-Understand, III-Apply, IV-Analyse, V-Evaluate, VI- Create

Q No.	Question	Marks	Taxonomy Level
Q1 a)	**Design** I and II flights of a dog legged staircase as shown in Fig. 1 for the following data: 25 i) Floor to floor height = 3.3 m; ii) Rise = 150 mm; Tread = 300 mm; iii) Width of landing = 1.25 m; iv) Material M 20, Fe 500. **Show** detailed load calculations and draw BMD for both flights and reinforcement details in sectional elevation for both flights. At ground floor, plinth beam is provided below 1st step. Assume suitable data if required.	15	I& VI

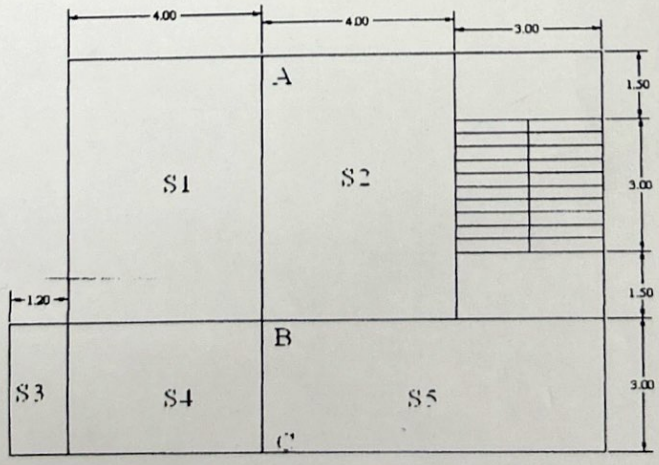


Fig 1

PRM

GCC

SAVITRIBAI PHULE PUNE UNIVERSITY
ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY
COLLEGE OF ENGINEERING, PUNE
Academic Year – 2022-23, Semester II
Civil Engineering Department
Unit Test II **Date :-**

Class: T.E. (A) Civil -2019 Course Subject: DRCS ..... **Class Room No. :** 411

SN	Roll No.	Name of Student	Marks	Sign
1	18CV027	Dhangare Jay Eknath	14	
2	19CV086	PHADATARE KIRAN SANJAY	15	
3	20CV001	ABHISHEK AVINASH WAGHMARE		AB
4	20CV002	ADHAV DEWANG SUNIL	15	
5	20CV003	ADIL AHMAD DAR	16	
6	20CV004	ARBAZ MOHAMMED ALTAF MAPKAR	14	
7	20CV005	AUTY VIRAJ MALURAJ	17	
8	20CV006	BACHATE HARSHVARDHAN RAJENDRA	AB	AB
9	20CV007	BACHHAV PRASAD NIMBA	AB	AB
10	20CV008	BARVE AJINKYA MOSHE	15	
11	20CV009	BASETWAR VAIBHAV ARJUN	16	
12	20CV010	BELDAR SANJOT NITIN	15	
13	20CV011	BHADANE HIMANSHU DILIP	10	
14	20CV012	BHALEGHARE PRATHAM PRADEEP	15	
15	20CV013	BHAMARE MANAS NANAJI	16	
16	20CV014	BHAREKAR ROHAN MARUTI	14	
17	20CV015	BHAWARI N'LANJAN KANTARAM	15	
18	20CV016	BHOSALE NIKITA NAMDEO	17	
19	20CV017	CHAUDHARI SOHAM DINESH	18	
20	20CV018	CHAVAN ABHISHEK AJAY	15	
21	20CV019	CHAVAN ROHIT RAVINDRA	16	
22	20CV020	CHAVAN SUYASH VIJAYKUMAR	13	
23	20CV021	CHAWADA ARYAN DHANANJAY	12	
24	20CV022	CHIRAG PRADIP MUNDADA	AB	AB
25	20CV023	CHITTE CHINMAY RAJESH	12	
26	20CV024	CHOUGULE KAUSTUBH RAJESH	AB	AB
27	20CV025	DANGADE KUNAL BABASAHEB	13	
28	20CV027	DAREKAR SUYASH BALASAHEB	14	
29	20CV028	DHANAWADE SHUBHAM RAVINDRA	12	
30	20CV029	DHUMAL PRAJWAL SUNIL	14	
31	20CV030	DIGHE HARSHAL SURESH	AB	AB
32	20CV031	DIVATE GIRISH MOHAN	AB	AB
33	20CV032	DOKE TUSHAR RAJENDRA	13	
34	20CV033	GADE KUNAL NANDU	14	AB
35	20CV034	GARGAM KOMAL SHANKAR	12	
36	20CV035	GAWADE MAYUR D	13	
37	20CV036	GAWALI YASH RAJENDRA	14	
38	20CV037	GHUGE PRAVIN SHIVAJI	AB	AB
39	20CV038	GODBHARLE VAISHNAVI D	13	
40	20CV040	GUNJAL VEDANT MILIND	12	

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

41	20CV041	GURAP DEVAYANI SHASHIKANT	19	
42	20CV042	HIRE MANDAR RAVINDRA	20	
43	20CV043	INGALE ASHISHKUMAR JAYAWANT	AB	AB
44	20CV044	INGALE PRASHANT KALURAM	20	
45	20CV046	JADHAV SANKET POPAT	AB	AB
46	20CV047	JADHAV TEJAS VISHWAS	19	
47	20CV048	JAGTAP AVISHKAR SATISH	AB	AB
48	20CV049	JAWALKAR MANTHAN MAHENDRA	19	
49	20CV050	JAYBHAYE SAKSHI SURESH	AB	AB
50	20CV051	JOSHI SOHAM SHRIRAM	AB	AB
51	20CV052	KALA SAMYAK SHONIT	AB	AB
52	20CV053	KALE DEVASHISH PRADIP	AB	AB
53	20CV054	KALE PRATIK BALU	20	
54	20CV055	KALE YUVRAJ DATTATRAY	18	
55	20CV056	KAMTHE SAHIL KALURAM	17	
56	20CV057	KAPRE PARTH PRASAD	AB	AB
57	20CV058	KARLEKAR DHANSHREE SANJEEV	15	
58	20CV059	KAUSHAL MAHESH SHINDE	16	
59	20CV060	KESEKAR SHAMBHURAJ SURYAKANT	17	
60	20CV061	KHAIRNAR VIRAJ BALU	16	
61	20CV062	KHANOLKAR YASHWANT PARASHURAM	15	
62	20CV063	KHARE KALPESH SHANTARAM	15	
63	20CV064	KOLATE TRUPTI ARVIND	18	
64	21CV301	AKHADE SAKSHI MAHADEV	17	
65	21CV302	BANKAR GAURAV SHRIKANT	16	
66	21CV303	BANKAR SREYAS SAHEBRAO	18	
67	21CV304	BHALSHANKAR SNEHA RAVI	12	
68	21CV305	BHASKAR NIYATI NARESH	13	
69	21CV306	BHATE TEJAS SACHIN	19	
70	21CV307	BHOSALE SHRAWANI BHARAT	12	
71	21CV308	BIRAJDAR HARIOM SHIVDARSHAN	13	
72	21CV309	CHAFLE SAHIL SHEMDEO	07	
73	21CV310	CHAVAN ADITYA VIKRAM	20	
74	21CV311	CHAVAN GAURI BHARAT	16	
75	21CV312	DESAI BRAVIMRAJ BAJIRAO	17	
76	21CV313	GAYKE SAURABH SHYAM	18	
77	21CV314	GHOM AWANTIKA SURYAKANT	19	
78	21CV315	GIRASE NIPUL RAVINDRASINGH	17	N.R.G

Total Students : 78

Total Present : 61

Total Absent : 17

P R Modak Modak

Name & Sign of Supervisor

Sr Supervisor

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name Devayani S. Gurap Roll No.: 20CV041

Subject Design of Reinforced Concrete Structures Division : A

Examination Unit Test - 1 Day & Date :

Question No.	1	2	3	4	5	6	7	8	9	10	Total Marks
Marks											18

Examiner Signature

Q. 1) a)

Ans. The section which is reinforced with longitudinal reinforcement in both tension and compression zone is known as doubly reinforced section

Under following circumstances doubly reinforced section are needed :

1) Sectional dimension are restricted due to requirement of head room.

2) Appearance and strength given in singly reinforced section is inadequate.

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

b)

Ans - Given:

$b = 300$ mm

$d = 400$ mm

$f_{ck} = 20$

$f_y = 415$

clear cover $= 25$ mm

Soln:

i) $\varepsilon_{sc} = 0.0035\left(1 - \frac{d_c}{x_{umax}}\right)$

$= 0.0035\left(1 - \frac{d_c}{x_{umax}}\right)$

$= 0.0035\left(1 - \frac{25}{192}\right)$

$\varepsilon_{sc} = 3.04 \times 10^{-3}$

$= 0.003$

0.00275	351.84
0.003	352
0.00380	360.9

$f_{sc} = 352$

$x_u = \frac{0.87 f_y A_{st} - f_{sc} A_{sc}}{0.36 f_{ck} b}$

$= \frac{0.87 \times 415 \times 1256.63 - 352 \times 226.19}{0.36 \times 20 \times 300}$

$x_u = 173.18$

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

$$Ast = \frac{\pi}{4} \times 4 \times (20)^2$$

$$= 1256.63$$

$$Mur = 0.36 f_{ck} b x_u (d - 0.42 x_u) + f_{sc} A_{sc} (d - d_c)$$

$$= 0.36 \times 20 \times 300 \times 173.18 (375 - 0.42 \times 173.18) + 352 \times 226.19 (375 - 25)$$

$$Mur = 140.93 \text{ KN.m}$$

3)

a)

→ Function of Distribution reinforcement

→ Distribution reinforcement is given to deal with shrinkage stress and temperature effects. After pouring of cement at the time of curing concrete will contract since the water in concrete gets used for hydration.

→ Distribution steel is provided in transverse direction to hold the main steel in position and also take care of shrinkage and temp. stresses.

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

Q.3) b)

Ans - Given :

Clear span = 3.8 m

LL = 3 KN/m²

FF = 1 KN/m²

Wall thickness = 230mm (bs)

fck = 20

fy = 415

Soln

1) ~~fy~~ deq = $\frac{\text{Span}}{20\text{MF}}$

= $\frac{3800}{20 \times 1.5}$

= 126.67

≅ 130 mm

D = d + clear sp cover

= 130 + 20

= 150 mm

2) Le = L + t or = L + d

= 3.8 + 0.23 = 3.8 + 0.13

= 4.03 = 3.93

3) Load Calculation

DL = 25D = 25 × 0.15 = 3.75 KN/m

Total load = 3.75 + 3 + 1

= 7.75

Wu = 1.5 × 7.75

= 11.625 KN/m

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

$$Mu = \frac{Wu\,(leff)^2}{8}$$

$$= \frac{11.625 \times (3.93)^2}{8}$$

$$Mu = 22.44 \times 10^6\ N.mm$$

6) $Mu = Mulim$

$$22.44 \times 10^6 = 0.138 \times 20 \times 1000 \times d^2$$

$$d = 90.16\ mm < 130\ mm$$

$$deq < dprovided$$

7) $$Ast = \frac{0.5 fck}{fy}\left[1 - \sqrt{1 - \frac{4.6 Mu}{fck\,b\,d^2}}\right] bd$$

$$= \frac{0.5 \times 20}{415}\left[1 - \sqrt{1 - \frac{4.6 \times 22.44 \times 10^6}{20 \times 1000 \times (130)^2}}\right] 1000 \times 130$$

$$Ast = 521.78$$

$$Astmin = 0.12 \times 1000 \times 150 / 100$$

$$= 180\ mm^2$$

$$Ast > Astmin$$

7) Main reinforcement

$$S = \frac{1000 \times \pi/4 \times (10)^2}{521.78}$$

$$S = 150.52$$

$$\approx 150\ mm$$

$S = 3d$ or $300\ mm$ ..... whichever is less.

Provide 10 mm # bar at 150 mm c/c.

HEAD OF DEPARTMENT
CIVIL ENGI... NG
...SSMS's COL... E-1.1

8) Distribution steel

$$S = \frac{1000 \times 50.27}{180}$$

$$= 279.28$$

$$= 280 \text{ mm c/c}$$

$S = 5d$ or 450 mm ... whicheves is less.

Provide distribution steel 8 mm ϕ bar at 280 mm

9) $A_{st\ prov} = \frac{1000 \times \pi/4 \times (12)^2}{150}$

$$= 436.33 \text{ mm}^2$$

$$F_s = 0.58 f_y \left[\frac{521.78}{436.33}\right]$$

$$f_s = 287.83$$

$$P_{t\ actual} = \frac{436.33 \times 100}{1000 \times 130}$$

$$= 0.331$$

$$\text{Required depth} = \frac{\text{Span}}{20 \text{ MF}}$$

$$= \frac{3800}{20 \times 1.45}$$

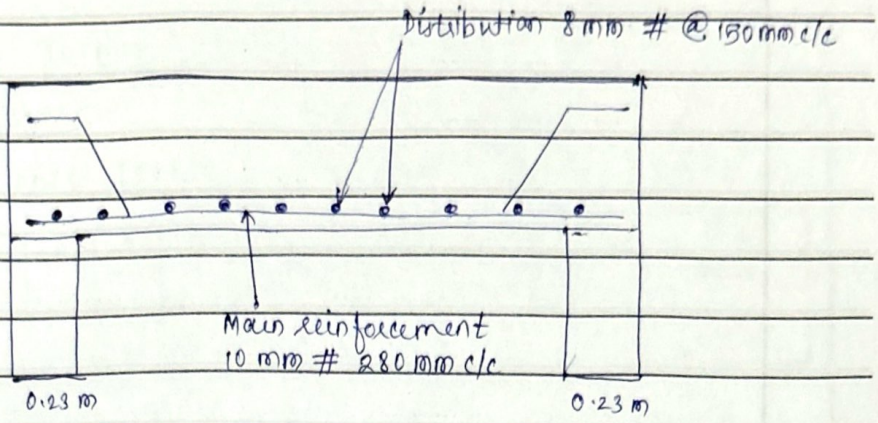
$$= 131.03$$

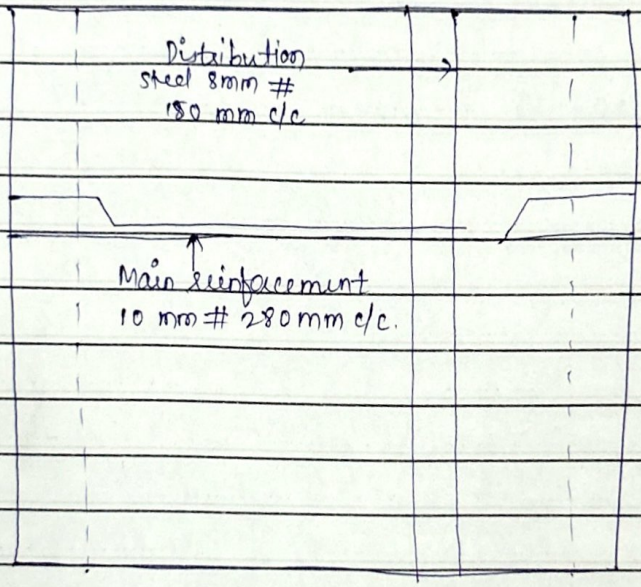
$$\cong 130 \text{ mm}$$

$d_{req} < d_{prov}$

Slab is safe in deflection

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.





HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Accredited by NAAC with "A+" Grade

DEPARTMENT OF CIVIL ENGINEERING
UNIT TEST- 3 A.Y. 2022-23 TERM-II

Class: TE (Civil Engineering)
Subject: Design of Reinforced Concrete Structures
Maximum Marks: 30
Time:

Semester: VI
Pattern: TE (2019 Course)
Duration: 1 hour
Date: 25/05/2023

Instruction for the students:
*1) Answer **Q1 or Q2; Q3 or Q4.***
2) Figures to the right indicates full marks.
*3) Use of **IS 456-2000** is allowed.*
4) If necessary, assume suitable data and indicates clearly.
5) Mere reproduction from is code as answer, will not be given full credit.

Course Outcome Statements:
CO5: Design & detailing of singly/doubly rectangular/flanged beams for flexure, shear, bond and torsion.
CO6: Design & detailing of short columns subjected to axial load, uni-axial/bi-axial bending and their footings.

Taxonomy Levels:
I-Remember, II-Understand, III-Apply, IV-Analyse, V-Evaluate, VI- Create

Q No.	Question	Marks	Taxonomy Level
Q1 a)	**Explain** different parameters of interaction curves for the design of column	**5 M**	**II**
b)	**Design** the reinforcement in a column of a 400 mm x 400mm, subject to an axial load of 150 kN under service dead load and live loads. The column has an unsupported length of 3.0 m and is restrained in both directions. Use M20 Concrete and Fe 500 steel.	**10 M**	**VI**
	OR		
Q2 a)	**Explain** minimum and maximum percentage of longitudinal reinforcement and how to decide diameter and spacing of lateral ties.	**3 M**	**II**
b)	**Design** a short reinforced concrete column of rectangular section to carry an ultimate load of 500 kN and ultimate moment 80 $kN.m$ acting about an bisecting the depth of the column. Assume the effective length of the column equal to 4.5 m, width of the supported beam is 300 mm. Use M20, Fe 415. Provide equal steel on both tension and compression sides. $L_{eff\,x}$ = 4.5 m and $L_{eff\,y}$ = 3.5 m.	**12 M**	**VI**

P.T.O.

a)	**Design** a footing for an axially loaded square column of 500 mm side, transmitting a load of Pu = 1000 *kN* and safe bearing capacity of soil is 300 kN/m^2. Use M20, Fe415.	**15 M**	**II**
	OR		
Q4 a)	**Design** a square footing for a 400 mm x 400 mm size column, carrying a direct load of 900 kN and subjected to a moment of 80 kN.m. The safe bearing capacity of soil is 150 kN/m^2. Use M20, Fe415	**15 M**	**VI**

****

SAVITRIBAI PHULE PUNE UNIVERSITY
ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY
COLLEGE OF ENGINEERING, PUNE
Academic Year – 2022-23, Semester II
Civil Engineering Department
Unit Test III **Date :-**
Class: T.E. (A) Civil -2019 Course **Subject: .....DRCS.....** **Class Room No. : 441**

SN	Roll No.	Name of Student	Marks	Sign
1	20CV001	ABHISHEK AVINASH WAGHMARE	12	
2	20CV002	ADHAV DEWANG SUNIL	13	
3	21CV301	AKHADE SAKSHI MAHADEV	14	
4	20CV004	ARBAZ M ALTAF MAPKAR		AB
5	20CV005	AUTY VIRAJ MALURAJ	12	
6	20CV006	BACHATE H RAJENDRA		AB
7	20CV009	BASETWAR VAIBHAV ARJUN		
8	21CV304	BHALSHANKAR SNEHA RAVI	12	
9	20CV013	BHAMARE MANAS NANAJI	13	
10	20CV014	BHAREKAR ROHAN MARUTI	14	
11	21CV305	BHASKAR NIYATI NARESH		AB
12	21CV306	BHATE TEJAS SACHIN	15	
13	20CV016	BHOSALE NIKITA NAMDEO	16	
14	21CV307	BHOSALE SHRAWANI BHARAT	15	
15	21CV308	BIRAJDAR HARIOM S.	18	
16	20CV018	CHAVAN ABHISHEK AJAY	13	
17	21CV310	CHAVAN ADITYA VIKRAM	14	
18	21CV311	CHAVAN GAURI BHARAT	15	
19	20CV019	CHAVAN ROHIT RAVINDRA	16	
20	20CV020	CHAVAN SUYASH VIJAYKUMAR	17	
21	20CV021	CHAWADA ARYAN DHANANJAY	10	
22	20CV022	CHIRAG PRADIP MUNDADA		AB
23	20CV023	CHITTE CHINMAY RAJESH	10	
24	20CV024	CHOUGULE KAUSTUBH RAJESH	10	
25	21CV312	DESAI BRAVIMRAJ BAJIRAO		AB
26	20CV030	DIGHE HARSHAL SURESH		
27	20CV031	DIVATE GIRISH MOHAN	12	
28	20CV032	DOKE TUSHAR RAJENDRA	12	
29	20CV034	GARGAM KOMAL SHANKAR	13	
30	20CV035	GAWADE MAYUR DHANANJAY	13	
31	20CV036	GAWALI YASH RAJENDRA	1	AB
32	21CV314	GHOM AWANTIKA SURYAKANT	13	
33	20CV037	GHUGE PRAVIN SHIVAJI	12	
34	21CV315	GIRASE NIPUL RAVINDRASINGH	12	

Total Stundets : 34
Total Absent : 08
Total Present : 26

Name & Sign of Supervisor **Sr Supervisor**

P. R. Satarkar

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

SAVITRIBAI PHULE PUNE UNIVERSITY
ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY
COLLEGE OF ENGINEERING, PUNE
Academic Year – 2022-23, Semester II
Civil Engineering Department
Unit Test I **Date :-**

Class: T.E. (A) Civil -2019 Course Subject: ...D.R.C.S..... Class Room No. : 444

SN	Roll No.	Name of Student	Marks	Sign
1	20CV038	GODBHARLE V DNYANOBA	13	
2	20CV040	GUNJAL VEDANT MILIND	14	
3	20CV041	GURAP DEVAYANI SHASHIKANT	12	
4	20CV042	HIRE MANDAR RAVINDRA	13	
5	20CV043	INGALE A JAYAWANT	14	
6	20CV044	INGALE PRASHANT KALURAM	13	
7	20CV046	JADHAV SANKET POPAT	12	
8	20CV047	JADHAV TEJAS VISHWAS	13	
9	20CV048	JAGTAP AVISHKAR SATISH	AB	
10	20CV050	JAYBHAYE SAKSHI SURESH	14	
11	20CV051	JOSHI SOHAM SHRIRAM	AB	
12	20CV052	KALA SAMYAK SHONIT	12	
13	20CV053	KALE DEVASHISH PRADIP	10	
14	20CV054	KALE PRATIK BALU	11	
15	20CV056	KAMTHE SAHIL KALURAM	10	
16	20CV057	KAPRE PARTH PRASAD	11	
17	20CV058	KARLEKAR DHANSHREE SANJEEV	12	
18	20CV059	KAUSHAL MAHESH SHINDE	13	
19	20CV061	KHAIRNAR VIRAJ BALU	14	
20	20CV062	KHANOLKAR Y PARASHURAM	AB	
21	20CV063	KHARE KALPESH SHANTARAM	13	
22	20CV064	KOLATE TRUPTI ARVIND	AB	
23	19CV086	PHADATARE KIRAN SANJAY	AB	
24	20CV003	ADIL AHMAD DAR	14	
25	20CV007	BACHHAV PRASAD NIMBA	AB	
26	21CV302	BANKAR GAURAV SHRIKANT	13	
27	21CV303	BANKAR SREYAS SAHEBRAO	13	
28	20CV008	BARVE AJINKAY MOSHE	12	
29	20CV010	BELDAR SANJOT NITIN	12	
30	20CV011	BHADANE HIMANSHU DILIP	15	
31	20CV012	BHALEGHARE PRATHAM P	16	
32	20CV015	BHAWARI NILANJAN KANTARAM	13	
33	21CV309	CHAFLE SAHIL SHEMDEO	AB	
34	20CV017	CHAUDHARI SOHAM DINESH	12	
35	20CV025	DANGADE KUNAL BABASAHEB	11	

Total Stundets : 35
Total Absent : 7
Total Present : 28

Name & Sign of Supervisor **Sr Supervisor**

P. R. Satorkar

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

SAVITRIBAI PHULE PUNE UNIVERSITY
ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY
COLLEGE OF ENGINEERING, PUNE
Academic Year – 2022-23, Semester II
Civil Engineering Department
Unit Test I **Date :-**

Class: T.E. (A) Civil -2019 Course Subject: ..... Room No. : FM LAB(23)

SN	Roll No.	Name of Student	Marks	Sign
1	20CV028	DHANAWADE RAVINDRA	12	
2	20CV029	DHUMAL PRAJWAL	13	
3	20CV027	DAREKAR SUYASH BALAS		
4	18CV027	Dhangare Jay Eknath		
5	20CV033	GADE KUNAL NANDU		
6	21CV313	GAYKE SAURABH SHYAM	12	
7	20CV049	JAWALKAR MANTHAN M	13	
8	20CV055	KALE YUVRAJ DATTATRAY		
9	20CV060	KESEKAR SHAMBHURAJ S		

Total Stundets : 09
Total Absent : 05
Total Present : 04

Name & Sign of Supervisor
P. R. Satarkar

Sr Supervisor

HEAD OF DEPARTMENT
CIVIL ENGINEERING
AISSMS's COE, PUNE-1.

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S
COLLEGE OF ENGINEERING, PUNE
DEPARTMENT OF: COMPUTER ENGINEERING

UNIT TEST: I

Class: B.E(A)	**AY: 2022-23 Term: II**
Course: High Performance Computing	**Course Code: 410250**
Time: 09:15 AM: 10:15 AM	**Max. Marks: 30**

CO 1: Understand various Parallel Paradigm

CO 2: Design and Develop an efficient parallel algorithm to solve given problem

Mention Cognitive Level: Remember, Understand, Apply, Analyze, Evaluate, Create

Q. No.		Question	Marks	Cognitive Level
Q1)	a)	Describe various applications of Parallel Computing	5	Understand
	b)	Explain the basic working principle of VLIW Processor?	5	Understand
	c)	Define Uniform Memory access and Non Uniform memory access with diagrammatic representation	5	Remember
		OR		
Q2)	a)	Describe SIMD, MIMD architecture with suitable diagram	5	Understand
	b)	Explain Architecture of an Ideal parallel computer	5	Understand
	c)	Write short note on Levels of Parallelism	5	Understand
Q3)	a)	How will you define processes and their mapping?	5	Remember
	b)	What are different decomposition techniques? Explain in detail.	5	Understand
	c)	Explain in details characteristics of task & task interaction.	5	Understand
		OR		
Q4)	a)	Enlist in details different parallel algorithm models.	5	Remember
	b)	What are the limitations of parallel performance?	5	Understand
	c)	Explain in details static mapping and dynamic mapping.	5	Understand

Course Teacher

Module Coordinator

Dept. Academic Coordinator

Head of Department

H.O.D.
Computer Engg Dept
AISSMS COE Pune

AISSMS
COLLEGE OF ENGINEERING

शामराव सहकारी संस्था

Accredited by NAAC with 'A+' Grade

Department of Computer Engineering

Unit Test & Assignment Record

Academic Year	2022-2023	Term	II
Subject	HPC	Class / Division	BE A
Name of Faculty	Vipul S. Gunjal		

Roll No.	Name of the Student	UT-1 (30)	UT-2 (30)	UT-3 (30)	Assignment (30)	Assignment (30)	
19CO001	AASHAY SACHIN BHUJBAL	28	26	26	29	30	
19CO002	ADMUTHE MITALI MANISH	27	26	28	30	27	
19CO004	ALEX SUNNY	26	27	30	29	28	
19CO005	AMOGH CHAUHAN	30	26	30	26	29	
19CO006	ARVIND SUDARSHAN	29	30	26	27	26	
20CO301	BHALCHIM PRIYA VISHWAS	29	27	29	30	28	
19CO009	BHILARE KSHITIJ SHASHIKANT	30	26	29	26	27	
19CO010	BHOSALE ATHARVA ABHAY	26	28	27	30	29	
19CO011	CHATANE SHREE ATUL	27	26	29	30	26	
19CO012	DABIR AISHWARYA SHARAD	26	30	27	26	30	
19CO013	DANDGE SHRIKANT ASHOK	28	29	27	30	28	
19CO015	DEOKAR HRISHIKESH MARUTI (TFWS)	26	28	29	27	26	
19CO016	DESHPANDE SUDHANSHU SUBODH (EWS)	30	29	30	26	28	
19CO017	DEVKATE KARAN KRISHNATH	27	28	26	30	29	
19CO018	DHOTE SAMIKSHA TILAKCHAND	30	26	27	28	30	
19CO019	DHUMAL PRAJAKTA DADABHAU	29	27	28	26	29	
19CO020	EKSAMBEKAR YASH SAGAR	26	30	26	30	28	
19CO021	GADGE SAHIL NIVRUTTI	26	28	27	29	29	
19CO022	GADKARI GAURAV SUDHIR	29	26	28	26	30	
19CO023	GAIDHANI PRAJWAL ASHOK	26	27	29	27	26	
20CO303	GAIKWAD SAKSHI ATUL	30	30	30	30	29	
19CO024	GAIKWAD UDAY VIJAYSINH	26	29	29	28	30	
20CO304	GATKAL SHRUTI VISHNU	26	28	26	29	28	
19CO025	GHADGE INDRAJEET SUBHASH	30	26	27	30	26	
20CO305	GHODAKE SHUBHAM SHIVAJI	29	29	26	26	28	
19CO026	GHUGE RUSHIKESH MADANRAO	27	30	30	27	29	

AISSMS
COLLEGE OF ENGINEERING

अभियांत्रिकी महाविद्यालय

Accredited by NAAC with "A+" Grade

Roll No.	Name of the Student	UT-1	UT-2	UT-3	Assignment 1	Assignment 2	
19CO028	HARSH TIWARI (J&K)	26	27	28	30	29	
19CO029	HATEKAR AISHWARYA TANAJI	27	26	29	27	28	
19CO030	JADHAV KIRTI PRADIP	30	30	26	27	29	
19CO031	JAGTAP ATHARVA MAHESH	29	26	29	28	30	
19CO032	JAGTAP HRUTVIK SHAHAJI	26	27	30	29	30	
19CO033	JAGTAP OMKAR DATTATRAY	28	26	28	30	29	
19CO034	JAGTAP PRATIK VINOD	30	29	30	29	30	
19CO035	JAGTAP SHREYA ATUL	26	26	28	30	29	
19CO036	JAMBHULKAR TUSHAR RAJU (TFWS)	29	27	29	30	27	
19CO037	KADALE PRATHAMESH KAMALAKANT	30	26	30	29	30	
19CO038	KAKANI PRANAV ARVIND	30	27	30	29	28	
19CO039	KALASKAR ROHAN RAJENDRA	26	30	29	27	26	
19CO040	KAMBLE PRATIK MAHENDRA	24	26	28	25	30	
19CO041	KARMAN SINGH SETHI	30	27	26	28	29	
19CO042	KAWALE ANUSHKA ANIL	29	30	29	30	26	
19CO043	KHADTARE ANURAG VIJAY	30	27	29	30	26	
19CO044	KHANDELWAL HARSH PRAMOD (EWS)	28	29	30	26	27	
19CO045	KHEDKAR PRATIKSHA BALASAHEB	28	30	28	29	30	
18CO031	KOTHAWADE RUSHIKESH KISHOR	26	26	27	29	30	
20CO306	MAHAJAN ABHIJIT RAJENDRA	26	30	28	29	30	
19CO049	MEHER SWANAND GURUNATH	30	26	28	29	30	
19CO050	MOHIT SUNIL SARODE	29	28	29	30	28	
20CO307	MOKALKAR RENUKA ASHOK	28	27	28	27	28	
19CO051	MULIK ABHISHEK SANJAY	26	28	26	26	29	
19CO052	NIKAM RITESH SANJEEVAN	27	29	29	28	30	
18CO040	PATIL KRISHNAKANT SANJAY	30	26	30	29	30	
19CO054	PAWAR ATHARVA SAMADHAN	29	30	30	30	27	
19CO055	PAWAR SHRUTI CHANDRAKANT	30	29	30	30	26	
19CO056	PINGALE PRATIK BAJIRAO	26	28	29	27	30	
20CO308	POOJA BALOO KHADE	28	30	30	26	29	
18CO046	PRANAV PRAKASH HABIB	27	30	27	27	28	
19CO058	RAJPUT RUPESH BHUPENDRASING (EWS)	30	28	26	29	27	

AISSMS
COLLEGE OF ENGINEERING

ज्ञानम् सकलजनहिताय

Accredited by NAAC with "A+" Grade

Roll No.	Name of the Student	UT-1	UT-2	UT-3	Assignment 1	Assignment 2	
19CO059	RAUT ATHARVA HEMANT	27	26	29	30	28	
19CO060	ROHAN DAYAL	26	29	30	28	29	
19CO061	SAGNIK ROY	30	30	29	26	27	
20CO309	SARDE SHRAVANI SHRIKANT (EWS)	29	28	26	30	29	
19CO062	SHAIKH ZAKI AHMED KHALID	25	30	27	28	30	
19CO063	SHARMA GUNJAN LAXMINARAYAN (EWS)	27	28	29	30	30	Gunjan
19CO064	SURYAWANSHI VEDANT KISHOR	29	27	28	26	30	
19CO065	SYED SABA MUSTAFA	30	26	28	30	27	
19CO066	TANVI PAIGUDE	26	27	30	29	26	
19CO067	TATIYA YASH ASHOK (EWS)	27	26	30	29	30	
19CO068	THAKARE TEJAL VINAYAK	24	30	28	29	27	
19CO069	TILEKAR VIRAJ VAIBHAV	28	26	30	29	30	
19CO070	UDAY SHARMA (JKSSS)	29	27	28	30	29	Uday
19CO071	WAGH MAHANT ISHWAR	26	28	27	30	29	
19CO072	YADNIK ABHILASH VIJAY (EWS)	27	30	29	30	28	
19CO073	ZOPE SHUBHAM MOHAN	26	27	29	30	26	
19CO074	ZOPE TANAY PRADEEP	30	30	30	29	26	Tanay
19CO053	PANCH LAXMI MUKUND	28	26	27	20	30	
19CO027	GURSHAN SINGH (JKSSS)	28	29	26	30	26	
18CO051	SALUNKE AKANKSHA TUKARAM	30	30	29	30	28	
19CO008	BHANU PRATAP SINGH (JKSSS)	29	29	28	26	27	Bhanu
19CO057	PRIYANSHU SHARMA (JKSSS)	30	30	28	27	26	
20CO302	BOROLE POURNIMA VIJAY	26	27	25	30	29	
19CO007	BADVE SHRIDHAN SANJAY	30	26	27	29	30	

Gunjal V.S

Name & Sign

Course Teacher

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name ALEX SUNNY Roll No.: 19C0004

Subject High Performance Computing Division : BE Computer A

Examination Unit I Day & Date : Friday 10/03/2023

Question No.	1	2	3	4	5	6	7	8	9	10	Total Marks
Marks	14	—		12							26/30

Examiner Signature

Q.1. A] Describe various applications of parallel computing.
B] Explain basic working principle of VLIW processor.
C] Define uniform memory access and non-uniform memory access with diagrams.

OR

Q.2. A] Describe SIMD, MIMD architecture with diagrams.
B] Explain the architecture of an ideal parallel computer.
C] Write short note on levels of parallelism.

Q.3. A] How will you define processes and their mapping?
B] What are the different decomposition techniques? Explain in detail.
C] Explain in detail characteristics of tasks and task interaction.

OR.

Q.4. A] Enlist in detail different parallel algorithm model.
B] What are the limitations of parallel performance.
C] Explain in detail static and dynamic mapping.

ans: 1.

A] Parallel computing refers to the technique of executing a task on multiple processors concurrently.
This aims to utilise the computing power of numerous processors.
Applications:

① Load balancing: Using parallel computing, various tasks can be distributed to multiple processors. So the task can be completed simultaneously in an effective manner. Load balancing may be static or dynamic.

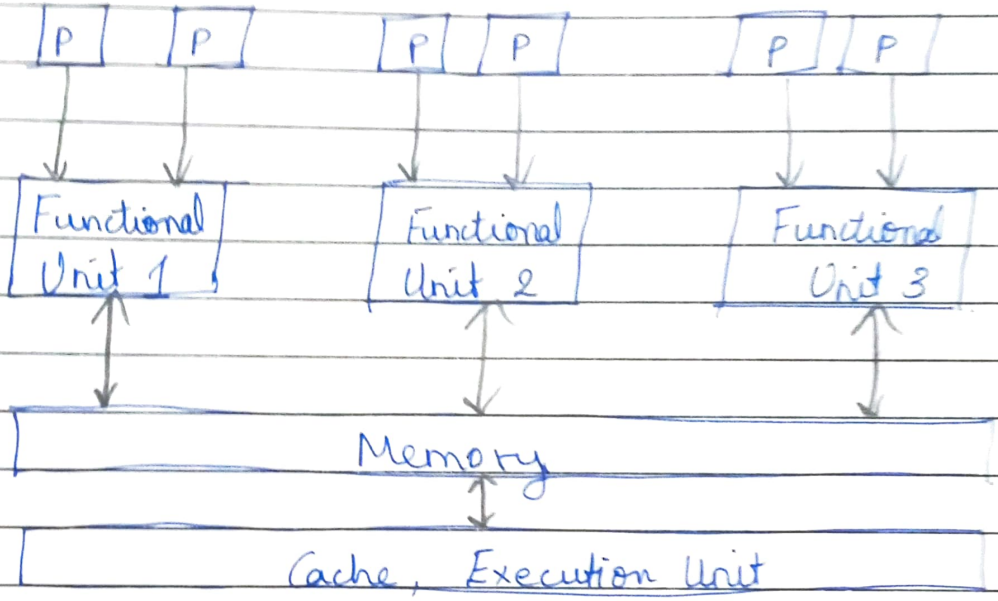
② Pipelining: Parallelism is used in pipelining architecture where tasks are scheduled one after another and be completed concurrently.

③ Super computers: In super-computers there are large number of processors that perform computations quickly and concurrently. Thus it is able to perform high computation jobs.

④ Multi-threading: A single process can be divided into multiple threads which can be solved independently and simultaneously. The final result is combined.

(c) Used in General Purpose Cache Based Microprocessor
This processor simultaneously accesses L1 and L2 cache to perform computations.

Im. B]



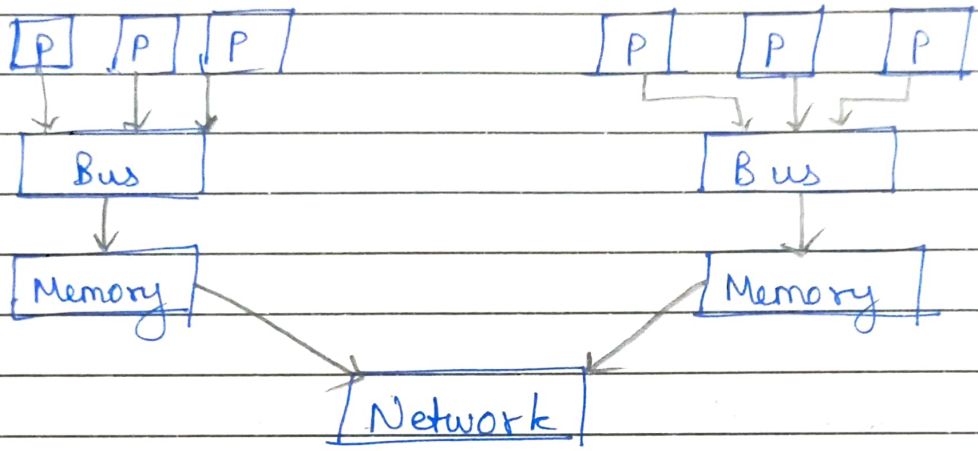
Architecture of VLIW.

* Very Long Instruction Word
- This is a processor that takes in very long words as its inputs.
- It processes large instructions very effectively.
- Generally, the input size ranges from 32 - 1024 bits.

- The main feature of a VLIW processor is that it has multiple functional units.
- These functional units process the very long word instructions concurrently.
- The processed instructions are feeded to a common memory.

- The common memory unit forwards the processed instruction to a common execution unit.
- The execution unit is the place where the tasks are ultimately executed in a parallel manner.

* NUMA architecture:

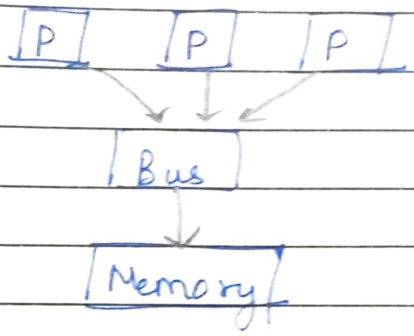


Non - uniform memory access:

- As the name suggests, in NUMA, the processes access memory in a non - uniform manner.
- Each process connects to a different bus.
- The bus facilitates the access to the memory for the individual processes.
- In the most abstracted level, the memory non - uniform memory are connected by a common network.
- The NUMA method is comparitively complex than the UMA method as it involves multiple buses over the

entire network.

* UMA architecture:



- In the uniform memory access architecture, all the processes access the memory in a uniform pattern.
- The memory access is direct.
- The way all processes access the memory for carrying out their tasks is same.
- This is a much more simple method.
- However, wait time for each process increases, as all access from the common memory location.
- Its implementation is simple.
- However it may not be as effective as the NUMA architecture.

Q.4.

A] There are different parallel algorithm models that can be implemented at various levels.

i) Bit level parallelism: This is the most basic level that implements parallel programming at the level of bits i.e C and

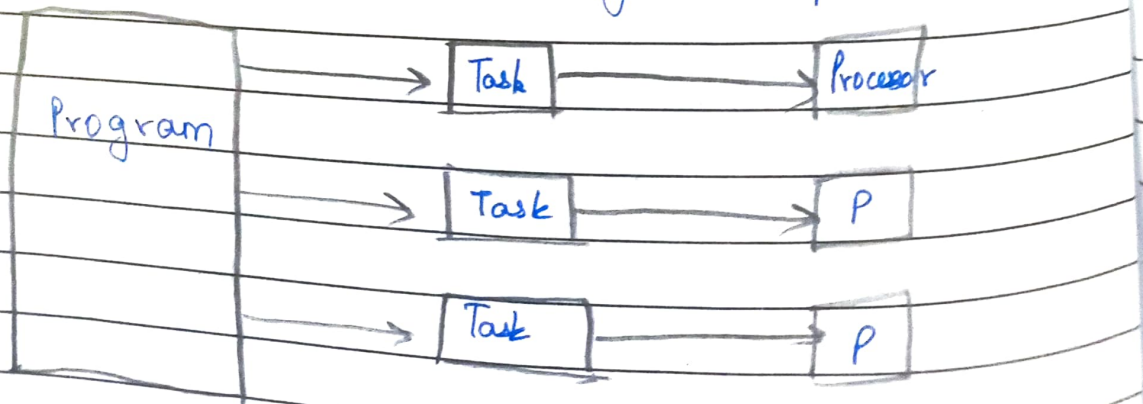
ii) Instruction level parallelism: This is a more abstracted level of parallelism that involves instructions that are a combination bits and bytes.

Parallel algorithms can be modelled into two types broadly:

① Synchronized: In this method, though tasks are are ~~implemented~~ distributed parallely, each task has to wait for the complete execution of previous task for its implementation.

- This is a much more time consuming method.
- It does not realise the actual aim of parallel computing many times.

② Asynchronized: In this method, tasks are executed and implemented on different processors simultaneously and concurrently
- The wait time is drastically reduced.
- The next task may need not wait for the current task to get completed.



B) Limitations of parallel computing:

1) Though parallel computing provides many benefits in the form of effective output and reduced waiting time it comes at a cost.

2) Parallel computing requires ~~high~~ systems with high computational power and powerful processors to achieve the benefits.

3) It requires the hardware cost increases as multiple processors and networking is required.

4) Since parallel computing requires distributed processors, all of them must be properly synchronized and connected to enable proper timing and functioning.

5) Load balancing techniques are required. So we need to separately invest in load balancers

6) Most of the times, the size and requirements of a task are not known. So this may lead to issues that arise dynamically during execution.

7) Parallel computing requires high energy input as in the form of electric power requirements. This may lead to increased costs.

Q] Two main methods of mapping of processes to respective processors are: i) Static mapping
ii) Dynamic mapping.

① Static mapping: This is the basic method of mapping tasks to processors.
- Here the tasks are mapped to processors prior to the execution of the algorithm
- All the task mapping is finished, then only the parallel algorithm is executed.
- This is a simpler method and easy to implement.
- Its types are: i) Deterministic static mapping
ii) Cyclic and acyclic static mapping
- Load balancing happens in a uniform manner.

② Dynamic mapping: As the name suggests, this is done during runtime.
- Tasks are mapped to processors during the execution of the parallel algorithm.
- Dynamic mapping is used when:
i) The number of tasks is not known
ii) The size of the tasks is not known
iii) Tasks are generated dynamically
- This is a much more effective method.
- Tasks of different sizes are allocated to processors according to their respective capacity. So it is non-uniform.
- However, it is more complex to implement.

22-23

Sem I

AISSMS
COLLEGE OF ENGINEERING

ज्ञानम् सकलजनहिताय

Accredited by NAAC with "A+" Grade

DEPARTMENT OF COMPUTER ENGINEERING

B.E. Computer, SEM I [2022-23]

Test: 2

SUBJECT: Blockchain Technology **[Sub. Code: 4 1 0 2 4 3]**

[Time: 1 hr Min 10] (Date:12/10/2022) Class : BE **[Max Marks: 30]**

Instructions to the candidates:

- Figures to the right indicate full marks.
- Assume suitable data , if necessary

CO3: Use Crypto wallet for cryptocurrency based transactions
CO4: Analyze the importance of blockchain in finding the solution to the real-world problems.

Q1. A) Explain how public block chains ensure the adherence of transaction and block-writing rules. [05]

Q1. B Differentiate between a public/permissionless and a private/permissioned blockchain. [05]

OR

Q2. A) How assets ownership use case can be implemented with private blockchain

Q2. B List down advantages and disadvantages of Consortium blokchain [05]

Q3. A) Writ a short note on DeFi, IOTA. [05]

Q3. B) Compare Bitcoin and Ethereum [05]

OR

Q4. A) What are Non fungible tokens? What are its applications [05]

Q4. B) What are the drawbacks of IOTA? [05]

Q5. A) What is cryptocurrency? Explain in brief. [05]

Q5. B) State and explain the advantages and disadvantages of cryptocurrency. [05]

OR

Q6.A) State and explain different types of cryptocurrencies [05]

Q6.B) Write a short note on Metamask. [05]

H.O.D.
Computer Engg. Dept

19C0031

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name Atharva Mahesh Jagtap. Roll No.: 19C0031

Subject Blockchain Technology Division : computer - A BE

Examination Unit Test 2. Day & Date : 12/10/22 Tuesday

Question No.	1	2	3	4	5	6	7	8	9	10			Total Marks
Marks													28/30 WF

Examiner Signature

Q1) A] Explain how public block chain ensures the adherence transaction & block writing rules.

(1) A public blockchain is permissionless blockchain allowing universal access to read, write & validate information stored in network.

(2) Public blockchain ensure the adherence of transaction & block writing rules through consensus protocol.

(3) The consensus process goes beyond rules that are written in blockchain code & involves incentive mechanisms to ensure about proper functioning of validator network.

(4) The code sets the limit on miner activities that can written into software for instance adding an invalid transaction, switching input or output addresses or modyfing transaction amount.

(5) However, code excludes all potential misbehaviour such as rewriting a block already included on the blockchain.

(6) These actions are regulated by implicit & explicit incentive mechanism.

(7) eg. of explicit mechanism is bitcoin & eg. of implicit

mechanism is agreement by miners not to mine on top of empty blocks.

Q1 B]

Public blockchain	Private blockchain.
(1) In this type of blockchain anyone can read, write & participate in blockchain. Hence it is permissionless blockchain.	(1) In this type of blockchain read & write is done upon invitation, hence it is permissioned blockchain.
(2) Public blockchain is decentralized.	(2) Private blockchain is centralized.
(3) It is slow.	(3) It is faster.
(4) Transaction per second are lesser in public blockchain.	(4) Transaction per second is more compared to public blockchain.
(5) It is more secure.	(5) It is less secure.
(6) Network actors don't know each other.	(6) Network actor know each other.
(7) eg. Bitcoin, monero, etc.	(7) eg. corda, R3, etc.

Q9) A] write short note on DeFi & IOTA.

a) DeFi -

(1) DeFi is a decentralized finance.

(2) Defi is a collective term for financial products & services that are accessible to anyone who can use ethereum - anyone with internet connection.

(3) Defi uses emerging technology to remove third party & centralized institutions from financial transactions.

(4) With defi the markets are always open & there are no centralized authorities who can block payments & deny the access.

(5) services that were previously slow & at risk of human error are automatic & safer now that they handled by code that anyone can inspect.

(6) The components of defi are stablecoins, software, & hardware enables development of application.

b) IOTA -

(1) IOTA is an open-source distributed ledger & cryptocurrency designed for internet of things (IoT)

(2) IOTA doesn't use miners to validate transactions instead nodes that can issue a new transaction on network must approve two previous transactions.

(3) IOTA has been the target of phishing, scamming, & hacking attempts which have resulted in thefts, of user tokens & extended periods of downtime IOTA token.

(4) IOTA token are stored in IOTA wallet protected by 81 character, similar to password. To access & spend the tokens, IOTA provides a cryptocurrency wallet.

Q3) 8]

Bitcoin	Ethereum
① The purpose of bitcoin is to replace national currencies during financial crisis of 2008.	① The purpose of ethereum is to utilize blockchain technology for maintaining a decentralized payment network.
② It doesn't have smart contracts.	② It have smart contracts.
③ Bitcoin runs on SHA-256 hash function.	③ Ethereum runs on Ethash proof-of-work algorithm.
④ The blocktime of bitcoin is 10 minutes.	④ Blocktime of ethereum is 12 to 15 seconds.
⑤ It have block limit of 1MB.	⑤ It don't have block limit.
⑥ Bitcoin transactions are only for keeping notes.	⑥ Ethereum transaction may contain executable code.

190003 I

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name Atharva Jagtap. Roll No.: 190003 I

Subject _____ Division : _____

Examination _____ Day & Date : _____

Question No.	1	2	3	4	5	6	7	8	9	10			Total Marks
Marks													

Examiner Signature _____

Q1] What different types of cryptocurrencies ?

① Bitcoin -

i) It is the first cryptocurrency that was introduced & considered the digital gold. A unit of bitcoin can broken down into satoshis, which is equivalent to relationship of rupees & paise.

ii) Furthermore, the bitcoin network is so designed that it can only have 21 million units of bitcoin circulation at any point in time.

iii) The limited availability is primary component that drives its market price, currently it is 18.39 million.

② Altcoins -

i) This category primary involves forks & alternative version of bitcoin. Although some altcoins are exponentially different from bitcoin & use varying algorithms.

ii) currently, there are some thousands of altcoins. Some of the notable altcoins are ethereum, factom, NEO, etc.

③ Tokens -

i) These are products of altcoins like ethereum & NEO.

ii) These cryptocurrencies don't have separate blockchain but instead run on decentralized apps created via such altcoins.

iii) However, tokens carry supremly low value compared to the other two types mentioned above, because they can only be used to purchase items from such decentralized apps or dApps.

Q6) B] Write short note on metamask.

① metamask is a type of ethereum wallet that bridges the gap between the user interfaces for ethereum (eg. DApps) & regular app (eg. chrome).

② It's a function is to inject a javascript library called web3.js into the namespace of each page your browser loads. Web3.js is written by the ethereum core team.

③ metamask is mainly, used as a plugin in chrome.

④ metamask is the trailblazing tool enabling user interactions & experience on web 3. It's a currency available as a browser extention & as a mobile app on both Android & iOS devices.

⑤ The purpose of documentation is to illustrate how to build a DApp with metamask.

⑥ metamask was created to meet the needs of secure & usable ethereum based websites. In particular it handles account management & connecting the user to blockchain.

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
(Accredited by NAAC with grade A+)

Department of Computer Engineering

Unit Test 2

Class: BE-I (A) **Subject:Blockchain Technology** 12/10/22

Sr.	Roll No.	Name of the Students	Marks	Sign
1	19CO001	AASHAY SACHIN BHUJBAL		
2	19CO002	ADMUTHE MITALI MANISH	28	
3	19CO006	ARVIND SUDARSHAN	26	
4	19CO007	BADVE SHRIDHAN SANJAY	19	
5	20CO301	BHALCHIM PRIYA VISHWAS	28	
6	19CO009	BHILARE KSHITIJ SHASHIKANT	26	
7	19CO010	BHOSALE ATHARVA ABHAY	28	
8	20CO302	BOROLE POURNIMA VIJAY	22	
9	19CO011	CHATANE SHREE ATUL	22	
10	19CO005	CHAUHAN AMOGH	28	
11	19CO012	DABIR AISHWARYA SHARAD	27	
12	19CO013	DANDGE SHRIKANT ASHOK	25	
13	19CO015	DEOKAR HRISHIKESH MARUTI	27	
14	19CO016	DESHPANDE SUDHANSHU SUBODH	25	
15	19CO017	DEVKATE KARAN KRISHNATH	29	
16	19CO018	DHOTE SAMIKSHA TILAKCHAND	28	
17	19CO019	DHUMAL PRAJAKTA DADABHAU	24	
18	19CO020	EKSAMBEKAR YASH SAGAR	20	
19	19CO021	GADGE SAHIL NIVRUTTI	24	
20	19CO022	GADKARI GAURAV SUDHIR	21	
21	19CO023	GAIDHANI PRAJWAL ASHOK	27	
22	20CO303	GAIKWAD SAKSHI ATUL	27	
23	19CO024	GAIKWAD UDAY VIJAYSINH	27	
24	20CO304	GATKAL SHRUTI VISHNU	26	
25	19CO025	GHADGE INDRAJEET SUBHASH	26	
26	20CO305	GHODAKE SHUBHAM SHIVAJI	27	
27	19CO026	GHUGE RUSHIKESH MADANRAO	AB	AB
28	19CO027	GURSHAN SINGH	16	
29	18CO046	Habib Pranav Prakash	25	
30	19CO029	HATEKAR AISHWARYA TANAJI		AB
31	19CO030	JADHAV KIRTI PRADIP	26	
32	19CO031	JAGTAP ATHARVA MAHESH	28	
33	19CO032	JAGTAP HRUTVIK SHAHAJI	25	
34	19CO033	JAGTAP OMKAR DATTATRAY	24	
35	19CO034	JAGTAP PRATIK VINOD		AB
36	19CO035	JAGTAP SHREYA ATUL	24	
37	19CO036	JAMBHULKAR TUSHAR RAJU		AB
38	19CO037	KADALE PRATHAMESH KAMALAKANT	17	
39	19CO038	KAKANI PRANAV ARVIND		AB
40	19CO039	KALASKAR ROHAN RAJENDRA		AB

41	19CO040	KAMBLE PRATIK MAHENDRA	27	
42	19CO041	KARMAN SINGH SETHI	22	
43	19CO042	KAWALE ANUSHKA ANIL	28	
44	20CO308	KHADE POOJA BALOO	18	
45	19CO043	KHADTARE ANURAG VIJAY		
46	19CO044	KHANDELWAL HARSH PRAMOD	24	
47	19CO045	KHEDKAR PRATIKSHA BALASAHEB	26	
48	18CO031	Kothawade Rushikesh Kishor	18	
49	20CO306	MAHAJAN ABHIJIT RAJENDRA	24	
50	19CO049	MEHER SWANAND GURUNATH	26	
51	20CO307	MOKALKAR RENUKA ASHOK	26	
52	19CO051	MULIK ABHISHEK SANJAY	20	
53	19CO052	NIKAM RITESH SANJEEVAN		
54	19CO053	PANCH LAXMI MUKUND	22	
55	18CO040	Patil Krishnakant Sanjay	28	
56	19CO054	PAWAR ATHARVA SAMADHAN		
57	19CO055	PAWAR SHRUTI CHANDRAKANT	26	
58	19CO056	PINGALE PRATIK BAJIRAO	19	
59	19CO057	PRIYANSHU SHARMA		
60	19CO058	RAJPUT RUPESH BHUPENDRASING		
61	19CO059	RAUT ATHARVA HEMANT		
62	19CO060	ROHAN DAYAL	19	
63	19CO061	SAGNIK ROY		
64	18CO051	SALUNKE AKANSHA TUKARAM	26	
65	20CO309	SARDE SHRAVANI SHRIKANT	19	
66	19CO050	SARODE MOHIT SUNIL	23	
67	19CO062	SHAIKH ZAKI AHMED KHALID	23	
68	19CO063	SHARMA GUNJAN LAXMINARAYAN	23	
69	19CO008	SINGH BHANU PRATAP		
70	19CO004	SUNNY ALEX	28	
71	19CO065	SYED SABA MUSTAFA	26	
72	19CO066	TANVI PAIGUDE	24	
73	19CO067	TATIYA YASH ASHOK		
74	19CO068	THAKARE TEJAL VINAYAK	28	
75	19CO069	TILEKAR VIRAJ VAIBHAV	20	
76	19CO028	TIWARI HARSH		
77	19CO070	UDAY SHARMA	17	
78	19CO064	VEDANT KISHOR SURYAWANSHI	24	
79	19CO071	WAGH MAHANT ISHWAR	23	
80	19CO072	YADNIK ABHILASH VIJAY	26	
81	19CO073	ZOPE SHUBHAM MOHAN		
82	19CO074	ZOPE TANAY PRADEEP	17	

Faculty Sign

H.O.D.
Computer Engg
AISSMS COE P

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
(Accredited by NAAC with grade A+)

Department of Computer Engineering

Unit Test 2

Class: BE-I (B) **Subject:Blockchain Technology** 12/10/22

Sr.	Roll No.	Name of the Students		Sign
1	19CS001	AGRAWAL ISHA MANISH	25	
2	20CS301	AHIRE SEJAL KISHOR	25	
3	19CS002	AKASH CHAUDHARE	20	
4	19CS003	ANUSHKA ASHOK JOSHI	21	
5	20CS302	AWATI SAIFALI SHEKALI	28	
6	20CS303	BAGADE SWARUPA DHANANJAY	25	
7	19CS004	BANGALI ADITYA PRASHANT	23	
8	19CS005	BHAGDE VAISHNAVI RAJESH	23	
9	19CS006	BHALERAO ADITYA AVINASH	23	
10	19CS041	BHALLA SANIYA	25	
11	20CS304	BHOSALE ADARSH AVINASH	22	
12	19CS007	BHOSALE RUCHA SURESH		
13	19CS008	BIRAJDAR AMIT KASHINATH	24	
14	19CS009	BORHUDE SHIVAM RAJENDRA		
15	19CS010	CHAKANKAR TEJAS VAIBHAV	23	
16	17CS011	Deshpande Chinmay Milind	23	
17	19CS012	DEVEN WAYKAR		
18	19CS013	DISHA RAJESH RATHOD	24	
19	19CS014	EDIGA LALIT KUMAR	18	
20	20CS306	GADE CHHAYA NANDU	27	
21	19CS015	GANDHI SAHIL PRASHANT		
22	19CS016	GARGHATE NINAD BHARAT	17	
23	20CS307	GHODEKAR NETRA YASHWANT	25	
24	19CS018	GIDWANI SAGAR RAJESH	24	
25	19CS019	GIRI SHIVAM NAVNATH	21	
26	18CS019	Gupta Tanuj Vijay	15	
27	19CS020	JADHAV PRANAV HARI	14	
28	19CS021	JOSHI PARTH PRAVIN	13	
29	19CS022	KADAM ADITYA RAJESH	21	
30	19CS023	KHAIRE GAURAV GOKUL	16	
31	18CS002	Khetarpal Aryan Dinesh	22	
32	19CS024	KULKARNI ABHINAV PRASANNA	28	
33	17CS025	Kunjeer Samarjeet Santosh	17	
34	20CS308	LABADE SRUSHTI RAJESH	24	
35	20CS309	LIGADE POOJA SHAHAJI	25	
36	19CS025	MACHE PRASAD PARSHURAM	22	
37	19CS026	MAHAJAN BHUSHAN LAXMAN	22	
38	19CS027	MEHTA RAJ TUSHAR	16	
39	19CS028	MORE TANMAY ARVIND	23	
40	19CS029	NAHAR MOHIT PANKAJ	17	

41	19CS038	NAWALE PRATIK DADASAHEB	20	
42	19CS030	ONKAR ANIL MIRAJKAR	24	
43	19CS031	OSWAL HARSH RAJESH	24	
44	19CS032	PADWAL AKSHAY DATTATRAY	19	
45	19CS017	PARTH GAWARE	16	
46	19CS033	PATIL AARYA ADHIKRAO	22	
47	19CS034	PATIL AISHWARYA ASHOK	27	
48	19CS035	PAWAR AISHWARYA PRAVIN	23	
49	19CS036	PINGALKAR VENKATESH SUNIL	17	
50	19CS037	PISE JANHAVI VILAS	18	
51	19CS039	RATHOD PRANAV BANDU	24	
52	19CS040	SAMEEDHA MORE	19	
53	19CS043	SARNAIK SAHIL MADHAV	—	
54	19CS044	SAW PRAVEENKUMAR BHUVANESHWAR	20	
55	19CS045	SHAH CHIRAG RAHUL	20	
56	19CS046	SHAH DIPESH	20	
57	19CS048	SHAIKH SADIYA ABDUL RAJJAK	25	
58	19CS049	SHASHANK VINOD ZANZAD	21	
59	19CS050	SHEGAR DIPTI SUNIL	17	
60	20CS305	SHIMPI CHAITANYA RAJENDRA	19	
61	19CS042	SHINDE SANKET ANILKUMAR	23	
62	19CS051	SHINDE TEJAS SHIVAJI	—	
63	19CS052	SHINKAR TEJAS NITIN	26	
64	19CS059	SHRUTI THORAT	24	
65	19CS054	SOMAN BHASKAR DHAVAL	25	
66	19CS055	SONAWANE SAMRUDDHI RAMDAS	—	
67	19CS056	SURYAWANSHI RUSHIKESH BHATU	17	
68	19CS057	TANDULWADKAR ADITYA SUNIL	20	
69	19CS058	TELTUMBADE SHRUTI RAMESH	26	
70	19CS060	UCHAGAONKAR RAJAS SHAILESH	21	
71	19CS011	VEDANT CHOUDHARY	20	
72	19CS061	WADKAR DEVANSHI PANKAJ	25	
73	19CS062	WAGH PURVA CHANDRAKANT	20	
74	19CS063	WAGHADHARE SHREYASH PRASAD	20	
75	19CS064	WAICHAL SRUSHTI NIRANJAN	/	
76	19CS066	ZIMAL SUDARSHAN ANANDA	/	
77	19cs047	Shaikh Adil	21	
78				
79				
80				
81				
82				

Faculty Sign

H.O.D.
Computer Engg Dept
AISSMS COE Pune

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Accredited by NAAC with "A+" Grade

Department of Electrical Engineering
Test – 2 (Unit III and IV)

Class: TE Electrical **Subject: EIDCBM**
Date: 13/10/2022 9.15-10.15 am **Max Marks: 20**

CO Statement: Explain and analyze maintenance and condition monitoring of various electrical equipments.
Understand and analyze the different parameters to Estimate the cost of electrical wiring system for a given load

QUESTIONS

Q1. Define and explain Polarization Index and Dielectric Absorption Ratio. (5M)

Q2. What are different maintenance strategies? (5M)

OR

Q3. What are the different insulation stressing factors? Explain them in brief (5M)

Q4. Explain the use of thermography in power systems (5M)

Q5. Explain the different types of wires generally used for residential wiring (5M)

Q6. What are the essentials of estimation and costing (5M)

OR

Q7. While estimating, how price catalogue, labour rates and schedule of rates are correlated. (5M)

Q8. Write down the general rules for residential wiring (5M)

Remarks:

Course Coordinator Module Coordinator PAC Coordinator H.O.D

All India Shri Shivaji Memorial Society's

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411001

Supervisor's Signature

Name: Anurag Patil Roll No.: 21EL315

Subject: EIDCBM Division:

Examination: Unit test - II Day & Date: 13/10/22 Thursday

Question No.													Total Marks.
Marks													17/20

Examiner's Signature

Q 5T.

→ Wires used for wiring purpose.

① V.I.R. - Vulcanised rubber wires. These are used in conduit wiring system. These are generally single core cable with 1 or 3 strands.

② TRS or CTS wires -

These are tough rubber sheath or cab type sheath. These wires are covered with a tough rubber compound which does not deteriorate even after a long period of use.

③ PVC wire - Poly vinyl chloride wires. Thermoplastic material is used which resists chemical reaction & direct sunlight. Now a day these wires are extensively used for residential & commercial wiring.

Q. 67.

A project, job or scheme is to be successively completed keeping quality & period of completion of the same as declared

Following data related to an estimate should be known to an estimator, while he prepares for electrical work project.

1. No. of points, half points, extra points be decided
2. No. of circuits as per IE rules for wiring be taken care of
3. Light & power circuits be separate as per rule
4. Material schedule must be kept in mind
5. Full knowledge of purchase system
6. Wiring route to suit for the controls be decided
7. What type of wiring methods can be selected
8. Drawing be drawn so that proper estimation can be done

Q 17. Polarization Index –

It is the ratio of IR value after 10 mins to IR value after 1 min.

$$PI = \frac{IR \text{ after } 10 \text{ mins}}{IR \text{ after } 1 \text{ min.}}$$

PI test along with IR test is conducted on HV electrical machines to determine service condition of the insulation. Only measuring insulation resistance by megger may not always give the readable result, as the resistive value of an electrical insulator may also vary with temp. This difficulty is solved by introducing polarity index test.

Dielectric Absorption test –

It is ratio of IR value after 60 sec to IR value after 30s.

$$DAR = \frac{IR \text{ value after } 60 \text{ sec}}{IR \text{ value after } 30 \text{ sec}}$$

DAR is useful for recording information about insulation.

It is based on the absorption effect of good insulation compared to that of moist or contaminated insulation.

If DAR is below 1.25, it indicates poor insulation.

Q.2> Different maintainance strategies -

① Routine maintainance -
It is the overall daily maintainance of the machine to ensure stability of the machine.

② Preventive maintainance -
Main objective is to prevent the machine from burning out, damages or breakdown

③. Planned maintainance -
This maintainance is carried out properly & regularly in order to prevent a machine from breaking down.

④. Condition based maintainance -
Maintainance performed based on known & expected behaviour, condition & the history of the machine Condition based maintainance was introduced to maintainance the correct equipment at right time.

⑤ Breakdown maintainance -
While failure of machine or breakdown in operation occurs due to serious electrical or mechanical fault, machine should be completely shut down immediately This is breakdown maintainance

This are the various maintainance strategies used while doing the maintainance of electrical machines

AISSMS
COLLEGE OF ENGINEERING
ज्ञानगंगा सर्वजनहिताय
Accredited by NAAC with "A+" Grade

Department of Electronics & Telecommunication Engineering

SE Unit Test-I Schedule 2022-23, Sem-II

Sr. No.	Subject	Day/Date	Time
1.	Signals & Systems	Monday, 27/03/2023	08.30am to 09.30am
2.	Control Systems	Tuesday, 28/03/2023	08.30am to 09.30am
3.	Principles of Communication System	Thursday, 29/03/2023	08.30am to 09.30am
4.	Object Oriented Programming	Friday, 30/03/2023	08.30am to 09.30am

Mrs. Y. P. Lad
Exam Co-ordinator

Mr. S. B. Dhekale
DAC

Dr. S. B. Dhonde
24/3/2023
HOD

Head
Department of Electronics & Telecommunication
AISSMS's COE PUNE-411001.

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Accredited by NAAC with "A+" Grade

Department of Electronics & Telecommunication Engineering

TE(E&Tc) Unit Test-I Schedule 2022-23, Sem-II

Sr. No.	Subject	Day/Date	Time
1.	Cellular Networks	Wednesday, 08/03/2023	08.15am to 09.15am
2.	Project Management	Thursday, 09/03/2023	08.15am to 09.15am
3.	Power Devices & Circuits	Friday, 10/03/2023	08.15am to 09.15am
4.	EL-II: Network Security/ Advanced Java Programming	Monday, 13/03/2023	08.15am to 09.15am

Mrs. Y. P. Lad
Exam Co-ordinator

Mr. S. B. Dhekale
DAC

Dr. S. B. Dhonde
HOD

Head
Department of Electronics & Telecommunication
AISSMS's COE PUNE-411001

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Accredited by NAAC with "A+" Grade

Department of Electronics & Telecommunication Engineering

BE(E&Tc) Unit Test-I Schedule 2022-23, Sem-II

Sr. No.	Subject	Day/Date	Time
1.	Fiber Optics Communication	Wednesday, 08/03/2023	08.15am to 09.15am
2.	EL-5: Mobile Computing	Thursday, 09/03/2023	08.15am to 09.15am
3.	EL-6: Digital Marketing	Friday, 10/03/2023	08.15am to 09.15am

Mrs. Y. P. Lad
Exam Coordinator

Mr. S. B. Dhekale
DAC

Dr. S. B. Dhonde
HOD

Head
Department of Electronics & Telecommunication
AISSMS's COE PUNE-411001.

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Accredited by NAAC with "A+" Grade

Department of Electronics & Telecommunication Engineering

BE(Elex) Unit Test-I Schedule 2022-23, Sem-II

Sr. No.	Subject	Day/Date	Time
1.	Process Instrumentation	Wednesday, 08/03/2023	08.15am to 09.15am
2.	EL-V	Thursday, 09/03/2023	08.15am to 09.15am
3.	EL-VI	Friday, 10/03/2023	08.15am to 09.15am

Mrs. Y. P. Lad
Exam Coordinator

Mr. S. B. Dhekale
DAC

Dr. S. B. Dhonde
HOD

Department of Electronics & Telecommunication
AISSMS's COE PUNE-411001.

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S
COLLEGE OF ENGINEERING, PUNE
DEPARTMENT OF: E & TC ENGINEERING

UNIT TEST: I

Class: BE- E & TC	**AY: 2022-23 Term: II**
Course: E & TC	**Course Code: 404191 (E): Mobile Computing (Elective – V)**
Time: 8.15 to 9.15 am , Date:09/03/2023	**Max. Marks: 30**

CO 1: Understand concepts of Mobile Communication

CO 2: Analyze next generation Mobile Communication System

Q. No.		Question	Marks	Cognitive Level
Q1)	a)	Classify Spread spectrum and explain Frequency Hop spread spectrum technology	8	Remember, Understand
	b)	Comparison of SDMA, TDMA, FDMA, and CDMA mechanisms on the basis of idea, terminals, signal separation etc for cellular system	7	Understand, Apply
		OR		
Q2)	a)	Consider a slow FHSS system with m-ary FSK with number of bits per symbol =2, two symbol per hop & PN sequence generated output with binary message of 011011011000. The message is transmitted using following PN sequence with K=3 { 001 110 101 000 101} . Plot output of the system	8	Evaluate
	b)	Explain the hidden and exposed terminal problem and Near far filed problem in MAC?	7	Understand
Q3)	a)	Explain about protocol architecture of GSM	8	Remember, Understand
	b)	Explain about call forwarding in GSM	7	Understand, Apply
		OR		
Q4)	a)	State the features of 5G network and draw the 5G network Architecture	8	Remember, Understand
	b)	Write a note on Mobility management in GSM	7	Understand

Course Teacher
Dr R R Itkarkar

Module Coordinator
Mrs. Y P Lad

Dept. Academic Coordinator
Mr S B Dhekale

Head of Department
Dr S B Dhonde

Head
Department of Electronics & Telecommunication
AISSMS's COE PUNE-411001.

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S
COLLEGE OF ENGINEERING, PUNE
DEPARTMENT OF: E&TC ENGINEERING

UNIT TEST: I

Class: TE	**AY: 2022-23 Term: II**
Course: Cellular Network	**Course Code: 304192**
Time: 8.15 to 9.15	**Max. Marks: 30**

CO 1: Understand fundamentals of wireless communications.

CO 2: Discuss and study OFDM and MIMO concepts.

Mention Cognitive Level: Remember, Understand, Apply, Analyze, Evaluate, Create

Q. No.		Question	Marks	Cognitive Level
Q1)	a)	Describe the term multipath fading.	5	Understand
	b)	Compute the median loss at a distance d=10 Km when carrier frequency fc=6GHz, the=40m, hre=2m for a large city if Hata model is used.	5	Apply
	c)	Compute the noise power at T=293K and noise figure = 5dB. The bandwidth = 25KHz.	5	Apply
		OR		
Q2)	a)	If a transmitter produces 50W of power, express the transmit power in units of a) dBm and b) dBW. If 50W is applied to a unity gain antenna with 900MHz carrier frequency, find the received power in dBm at a free space distance of 100m from the antenna.	5	Apply
	b)	Compute the median loss at a distance d=10 Km when carrier frequency fc=2.1GHz, the=40m, hre=2m for a small city if Hata model is used.	5	Apply
	c)	Describe the relation between noise power at receiver and temperature.	5	Understand
Q3)	a)	Explain in detail multicarrier modulation technique.	5	Understand
	b)	Summarize the advantages and disadvantages of OFDM.	5	Understand
	c)	Explain in short about Generations in Mobile communication.	5	Understand
		OR		
Q4)	a)	Draw and describe the block diagram the transmitter and receiver of multicarrier modulation.	5	Understand
	b)	Describe with neat diagram OFDM technique.	5	Understand
	c)	Explain advantages of 4G.	5	Understand

Course Teacher

Module Coordinator

Dept. Academic Coordinator

Head of Department

2022-23

A.I.S.S.M.S. College of Engineering Pune 411 001

Attendance Sheet (UNIT TEST 2022-23) Unit Test - 1

T.E. (E & Tc)

Date : 26 / 08 / 2022 Block No :

Time : 9am to 10 Sub : - Microcontrollers Room No. : 425

SR. NO.	ROLL NO.	NAME OF THE STUDENT	Signature	
1	20ET041	MORE DHIRAJ SHASHIKANT		09
2	20ET042	MORE SIDDHI SACHIN		13
3	20ET043	NANAWARE KETAKI SUBHASH		09
4	20ET044	PARKHE SAHIL SANJAY		12
5	20ET045	PATIL NIRAJ SUNIL		10
6	20ET046	PATIL VISHWESHWAR SUBHASH		07
7	20ET047	PAWAR ADITYA SATYAWAN		11
8	20ET048	RAJWEE PRASHANT WABLE		22
9	20ET049	RAVANGAVE YASH ESHWAR		20
10	20ET050	REDEKAR PRIYANKA SHAHAJI		19
11	20ET051	SAGAR PRITI ANKUSH		13
12	20ET052	SAHANI SHASHIRAJ BRIJBHUSHAN		13
13	20ET054	SHAHAPURE PRATHAMESH YOGESH		12
14	20ET055	SHAIKH ZEESHAN ALI		00
15	20ET056	SHELAR YASHRAJ YUVARAJ		14
16	20ET057	SHIKALGAR ATIF AHMADALI		10
17	20ET058	SHINDE AISHWARYA SANJAY		04
18	20ET059	SHINDE SAKSHI SURENDRA		12
19	20ET060	SHIVARKAR SAMRUDDHI RUPESH		07
20	20ET061	SIDDHESH VISHWASRAO BADGUJAR		11
21	20ET062	SINGH SHRISTI RAISAHEB		10
22	20ET063	SONAR JOTSHNA PRAMOD		05
23	20ET064	SUDHANSH DONGARE		07
24	20ET065	TANPURE OMKAR VITTHAL		09
25	20ET067	VYAWAHARE ATHARVA SUHAS		00
26	20ET068	WALKE ABHISHEK JITENDRA		09
27	20ET069	ZINJURDE SHIVAM RAJENDRA		09
28	20ET201	SURAJ SANJAY METE		05
29	21ET301	ANVEKAR ATUL RAMESHWAR		06
30	21ET302	BANDARKAR VEDANT YASHWANT		01
31	21ET303	JADHAV ANISH SANJAY		06
32	21ET304	KADAM PRITI TUKARAM		14
33	21ET305	MAHAJAN OMKAR SANTOSH		01
34	21ET306	PAKALE OM		06
35	21ET307	SASHTE SANIKA SHIVRAJ		17
36	21ET308	SHERKHANE PRAMILA GANGARAM		00
37	21ET309	TANDALE NITIN RAMESHWAR		07
38	21ET401	PAWAR ABHAY SNJAY		00
39				
40				

Total Present student 38

Total Absent Student - Nil -

Total Number of Student 38

Signature

Sr. Supervisor Mr. N. P. Mawale

A.I.S.S.M.S. College of Engineering Pune 411 001

Attendance Sheet (UNIT TEST 2022)

T.E. (E & Tc)

PPV

Date : 26 / 08 / 2022 Block No : I

Time : 8:30 am to pm Sub : - Microcontroller Room No. : 417

SR. NO.	ROLL NO.	NAME OF THE STUDENT	Signature	
1	19ET008	BHOSKAR PRADNYA		11+2=13
2	20ET001	ANGRE DEVANG KISHOR		12+2=14
3	20ET002	ATHARVA VIJAY SHELKE		18
4	20ET003	ATKIRE AJAY VISHWAS	A	—
5	20ET004	BIRAJDAR VIRAKSHI SHIVALINGAPPA		23
6	20ET005	BODHE SHUBHAM GANESH	A	—
7	20ET006	BORAWAKE SOHAM DHANANJAY		13
8	20ET008	CHANDANE NUPUR SUNIL		12
9	20ET009	CHOUDHARY PRAVEEN RATARAM		08
10	20ET010	CHOUGALE SIDDHANT SURESH		13
11	20ET011	DADDI ANIKET GIRISH		11
12	20ET012	DALAVE VAISHNAVI RAMESHRAO		15
13	20ET013	DESAI PRANAV SANJAY		18
14	20ET014	DESHPANDE VISHAL VIJAY	A	—
15	20ET015	DEVALE NIRANJAN NIVRUTTI		00
16	20ET016	DEVKATE YOGESH VINOD	A	—
17	20ET017	DHOPATE VEDANT ABHAY		13
18	20ET018	GANDHI RISHI HEMANT		20
19	20ET019	GHADGE SOHAN SUNIL	A	—
20	20ET020	GODASE OMKAR SANJAY		05
21	20ET021	GOSWAMI ANIRUDDHA	A	—
22	20ET022	GUJAR ADITYA SANJAY		18
23	20ET023	GUJAR MAITHILI RAJESH		10
24	20ET024	HAPSE ATHARV SHASHANK	A	—
25	20ET025	HIRAVE AKSHAY DATTATRAY		08
26	20ET026	JADHAV MANALI GOPAL	A	—
27	20ET027	JADHAV SHRADDHA HIRAMAN	A	—
28	20ET028	JAGTAP ANJALI MANIK		11
29	20ET029	JANHVI SHENDRE		05
30	20ET030	JANJAL RUSHITA		16
31	20ET031	KADAM ATHARVA ANAND		13
32	20ET032	KADU VISHWAJA MANISH		16
33	20ET033	KAMBLE RUTHVIK RAVINDRA		18
34	20ET034	KAWALE ARNAV HEMANT	A	—
35	20ET035	KAZI SAIFODDIN RAJIYODDIN		17
36	20ET036	LONDHE GAURAV SANTOSH		18
37	20ET037	MANE MOHIT SANJAY		06
38	20ET038	MARE KRISHNA BALAJI	A	—
39	20ET039	MOHD AQIB		07
40	20ET040	MORE DEEPRAJ BALASAHEB		02

64611
EC 63

Total Present student 30

Total Absent Student 10

Total Number of Student 40.

Sign of

SE Supervisor

S. B. Thakare

AISSMS
COLLEGE OF ENGINEERING

ज्ञानम् सकलजनहिताय

Accredited by NAAC with "A+" Grade

Vision: To be recognized as a premier centre in the field of mechanical engineering education.

Department of Mechanical Engineering

UNIT TEST: II	
Class: TE Mechanical	**AY: 2022-23 Term: II**
Course: Composite Materials	**Course Code: 302052-A**
Time: 1 Hour **Date: 04/2023**	**Max. Marks: 30**

CO 1: CATEGORISE and **APPLY** Metal Matrix Process from possessions landscape.

CO 2: DETERMINE volume/weight fraction and strength of Composites.

Q. No.		Question	Marks
Q1)	a)	**Write** typical reinforcements used in particle type metal matrix composites.	07
	b)	**Explain** squeeze-casting process for fabricating metal matrix composites.	08
		OR	
Q2)	a)	**Give** the broad categorization of processes for fabricating metal matrix composites	07
	b)	**Describe** spray-forming process for fabricating metal matrix composites.	08
Q3)	a)	**Derive** longitudinal and transverse Young's modulus of unidirectional composite.	07
	b)	In a glass/epoxy composite, fibers are 55% by volume. The tensile strength and the Young's modulus of fibers are 1 GPa and 70 GPa respectively. The tensile strength and the Young's modulus of epoxy are 55 MPa and 3 GPa respectively.**Calculate**the tensile strength and the Young's modulus of the composite.	08
		OR	
Q4)	a)	**Compare** isotropic and anisotropic materials.	07
	b)	Carbon fibers (50% by volume) and polyimide matrix have the following properties. E_f=280 GPa, E_m = 276 MPa, ν_f=0.2 and ν_m=0.3. **Compute** (a) the elastic modulus in the fiber direction and transverse to fiber direction (b) the major and minor Poisson's ratios.	08

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Accredited by NAAC with "A+" Grade

Vision: To be recognized as a premier centre in the field of mechanical engineering education.

Department of Mechanical Engineering

UNIT TEST: II

Class: TE Mechanical	**AY: 2022-23 Term: II**
Course: Composite Materials	**Course Code: 302052-A**
Time: 1 Hour **Date: /04/2023**	**Max. Marks: 30**

CO 1: CATEGORISE and **APPLY** Metal Matrix Process from possessions landscape.

CO 2: DETERMINE volume/weight fraction and strength of Composites.

Q. No.		Question	Marks
Q1)	a)	**Write** typical reinforcements used in particle type metal matrix composites. *Names of reinforcement 3 marks* *simple sketches 3 marks* *one application 1 mark*	07
	b)	**Explain** squeeze-casting process for fabricating metal matrix composites. *Type of method 1 mark* *sketches 4 marks* *Explanation 3 marks*	08
		OR	
Q2)	a)	**Give** the broad categorization of processes for fabricating metal matrix composites. *Categories 1 mark* *Classification 3 marks* *Explanation 3 marks*	07
	b)	**Describe** spray-forming process for fabricating metal matrix composites. *Type of method 1 mark* *sketches 4 marks* *Explanation 3 marks*	08
Q3)	a)	**Derive** longitudinal and transverse Young's modulus of unidirectional composite. *Definition of modulii2 marks* *Modulus 12 marks* *Modulus 2 3 marks*	07
	b)	In a glass/epoxy composite, fibers are 55% by volume. The tensile strength and the Young's modulus of fibers are 1 GPa and 70 GPa respectively. The tensile strength and the Young's modulus of epoxy are 55 MPa and 3 GPa respectively.**Calculate**the tensile strength and the Young's modulus of the composite. *Formula of Young's modulus 2 marks* *Value of Young's modulus 2 marks* *Failure strain of fiber 2 marks* *Value of tensile strength 2 marks*	08
		OR	
Q4)	a)	**Compare** isotropic and anisotropic materials. *3 points of difference 2 marks each* *Example of each material 1* mark	07
	b)	Carbon fibers (50% by volume) and polyimide matrix have the following properties. E_f=280 GPa, E_m = 276 MPa, ν_f=0.2 and ν_m=0.3. **Compute** (a) the elastic modulus in the fiber direction and transverse to fiber direction (b) the major and minor Poisson's ratios. *Formula of elastic moduii 2 marks* *Value of of elastic moduii2 marks* *Major Poisson's ratio2 marks* *Minor Poisson's ratio2 marks*	08

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Accredited by NAAC with "A+" Grade

Department of Mechanical Engineering

Vision: To be recognized as a premier centre in the field of mechanical engineering education.

UNIT TEST: II

Class: TE Mechanical **AY: 2022-23 Term: II**
Course: Composite Materials **Course Code: 302052-A**
Time: 1 Hour **Date:27/04/2023** **Max. Marks: 30**

CO 1: CATEGORISE and **APPLY** Metal Matrix Process from possessions landscape.
CO 2: DETERMINE volume/weight fraction and strength of Composites.

Q. No.		Question	Marks
Q1)	a)	**Classify** the metal matrix composites based on various types of matrix and reinforcement materials.	07
	b)	**Explain**powder metallurgy process for fabricating metal matrix composites.	08
		OR	
Q2)	a)	**Explain** the rule of mixture with examples.	07
	b)	**Describe**stir-casting process for fabricating metal matrix composites.	08
Q3)	a)	**Explain**five ultimate strength parameters of a unidirectional composite lamina.	07
	b)	For a unidirectional carbon/epoxy lamina, the constituent material properties are as follows:$E_{1f} = 375\ GPa, \left(\sigma_{1f}^{T}\right)_{Ult} = 3000\ MPa, E_m = 3.6\ GPa, (\sigma_m^T)_{Ult} = 72\ MPa.$ Take volume fraction of fiber as 0.7. **Find** a) the ultimate tensile strength for a carbon/epoxy lamina. b) the minimum and critical fiber volume fraction.	08
		OR	
Q4)	a)	**Write** note on tensile testing of unidirectional composites.	07
	b)	For a unidirectional carbon/epoxy lamina, the constituent material properties are as follows:$E_{1f} = 240\ GPa, E_m = 3.6\ GPa, \left(\sigma_{2f}^{T}\right)_{Ult} = 36\ MPa, (\sigma_m^T)_{Ult} = 72\ MPa.$ Verify that the transverse tensile strength of the lamina is same as the tensile strength of the matrix. Take the fiber volume fraction as 0.6.	08

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Accredited by NAAC with "A+" Grade

Vision: To be recognized as a premier centre in the field of mechanical engineering education.

Department of Mechanical Engineering

UNIT TEST: II

Class: TE Mechanical	**AY: 2022-23 Term: II**
Course: Composite Materials	**Course Code: 302052-A**
Time: 1 Hour **Date: 27/04/2023**	**Max. Marks: 30**

CO 1: CATEGORISE and **APPLY** Metal Matrix Process from possessions landscape.

CO 2: DETERMINE volume/weight fraction and strength of Composites.

Q. No.		Question	Marks
Q1)	a)	**Classify** the metal matrix composites based on various types of matrix and reinforcement materials. *Classification based on reinforcement 3 marks* *Classification based on matrix 3 marks* *one application each 1 mark*	07
	b)	**Explain** powder metallurgy process for fabricating metal matrix composites. *Type of method 1 mark, sketches 4 marks* *Explanation 3 marks*	08
		OR	
Q2)	a)	**Explain** the rule of mixture with examples. *ROM for elastic moduli and density 4 marks* *Explanation 3 marks*	07
	b)	**Describe** stir-casting process for fabricating metal matrix composites. *Type of method 1 mark* *sketches 4 marks* *Explanation 3 marks*	08
Q3)	a)	**Explain** five ultimate strength parameters of a unidirectional composite lamina. *Definition of modulii2 marks, Modulus 12 marks* *Modulus 2 3 marks*	07
	b)	For a unidirectional carbon/epoxy lamina, the constituent material properties are as follows:$E_{1f} = 375\ GPa, (\sigma_{1f}^T)_{Ult} = 3000\ MPa, E_m = 3.6\ GPa, (\sigma_m^T)_{Ult} = 72\ MPa.$ Take volume fraction of fiber as 0.7. **Find**the ultimate tensile strength for a carbon/epoxy lamina and the minimum and critical fiber volume fraction. *Formula of ultimate tensile strength 2 marks* *Value of ultimate tensile strength 2 marks* *Formula of minimum volume fraction2 marks* *Value of minimum volume fraction2 marks*	08
		OR	
Q4)	a)	**Write** note on tensile testing of unidirectional composites. *Objective of the test: 2 marks, Sketch: 2 marks, Explanation: 3 marks*	07
	b)	(a) For a unidirectional carbon/epoxy lamina, the constituent material properties are as follows:$E_{1f} = 240\ GPa,\ E_m = 3.6\ GPa, (\sigma_{2f}^T)_{Ult} = 36\ MPa, (\sigma_m^T)_{Ult} = 72\ MPa.$ Verify that the transverse tensile strength of the lamina is same as the tensile strength of the matrix. Take the fiber volume fraction as 0.6. *Formula of elastic moduii 2 marks* *Value of of elastic moduii2 marks* *Major Poisson's ratio2 marks* *Minor Poisson's ratio2 marks*	08

AISSMS
COLLEGE OF ENGINEERING

ज्ञानम् सकलजनहिताय

Accredited by NAAC with "A+" Grade

Department of Mechanical Engineering

Vision

Academic Year : 2022-23 (Term I)

Test : II

Class :	TE Mechanical	Subject:	Composite Materials (302052-A)
Date :	Saturday, May 13, 2023	Max Marks :	30

Mark list

Roll No	Name of the Student	Marks
19ME071	Paipare Sahil Prakash	AB
20ME002	AHER KUNAL BALASAHEB	AB
20ME003	AKOLKAR HARSHAL	AB
20me004	ALATE SHRIRAM VIJAY	4
20ME005	ALOK	AB
20ME006	AWAGHADE PRATHMESH VIJAY	AB
20ME007	AWASTHI HRUTIK CHETAN KUMAR	AB
20ME008	BHANDARE SUYASH BHAGWAN	2
20ME012	CHAVAN DIGVIJAY SURENDRA	AB
20ME013	DAHIBHATE OMKAR ANANT	AB
20ME014	DAREKAR SANKET AVINASH	AB
20ME015	DAYE SARTHAK RAVINDRA	AB
20ME016	DENGALE HARSHVARDHAN AJIT KUMAR	0
20ME018	DHEMBARE RANJITSINH DNYANDEO	AB
20ME019	DHOKNE AAYUSH MUKESH	AB
20ME020	DHUMAL DHIRAJ	AB
20ME021	GAGARE AARYAN	AB
20ME022	GORDE RUSHIKESH	AB
20ME025	GUDD ABHISHEK GANGADHAR	AB
20ME026	GULAMI HYDER ALI HASSAN ALI	AB
20ME027	GURAV SUDHANSHU SUHAS	3
20ME028	HARSH THAKUR	7
20ME029	HATKHAMBKAR ADVAIT SURENDRA	AB
20ME030	HORNE RUSHIKESH SHAILESH	AB
20ME032	JAGTAP HARSHAL	AB
20ME033	JALANDAR NIKITA GOPALSING	AB
20ME034	KALE SAURABH	AB
20ME036	KALE VAIBHAV	1
20ME037	KALE VISHWAJEET BALAJI	AB
20ME039	KALOKHE PRAJWAL DILIP	2
20ME040	KAMBLE ADITYA SANJAY	2
20ME043	KANADE HRITIK RAJENDRA	7
20ME048	KHANDAGALE SAURABH SANJAY	AB
20ME049	KHANDRE OMKAR JAYKUMAR	7
20ME050	KHATU ISHA SUDHIR	2
20ME053	KODNIKAR SARVESH UMESH	AB
20ME056	KULKARNI ATHARVA SUNIL	AB
20ME057	MAHAJAN AKSHAY	AB
20ME058	MAID NIKHIL SADASHIV	AB

20ME061	MORE KAUSHAL GULAB	AB
20ME062	MANTHAN MUKE	AB
20ME063	SEJAL SHANKAR MURKAL	AB
20ME067	PARKALE ABHISHEK RAJESH	12
20ME068	PARSURE PRALHAD NAGNATH	AB
20ME069	PATIL ALOK DEVIDAS	AB
20ME070	PATIL DHARMRAJ SHAMBHURAJE	AB
20ME071	PATIL PRATIK PRAVIN	13
20ME075	PATIL SUHANI SUNIL	AB
20ME076	PATIL YASHRAJ RAVINDRA	15
20ME079	PAWAR SUHAMI RANJIT	AB
20ME081	PEDNEKAR MRUNMAYEE RAVINDRA	AB
20ME084	RAGHUVANSHI VAIBHAV MUKUND	8
20ME085	RAJALE CHITRA DNYANDEO	AB
20ME086	ARYA SURESH RAJEBHOSALE	11
20ME088	RANE BHARGAV DEVENDRA	AB
20ME089	SALUNKE INDRAJIT MANOJ	AB
20ME090	SALVI NEEL SANTOSH	7
20ME091	SALVI TANVI YASHWANT	AB
20ME092	SANWARE YASH MANOHAR	AB
20ME095	SAWANT ATHARVA RAKESH	10
20ME096	SAWANT PREMKUMAR SANJAY	AB
20ME097	DEEPANJALI SHINDE	AB
20ME098	SHINDE KARTIKRAJE VISHNU	9
20ME099	SHINDE PARTH VIJAY	11
20ME102	SISODIYA SUSHANK MAHESHKUMAR	AB
20ME103	SUHANA SHAIKH	AB
20ME104	SUKALE RUTIK CHANDRAKANT	9
20ME105	OMKAR KIRAN SURYAWANSHI	AB
20me106	GAURAV DEEPAK THORAT	11
20ME107	TODKAR ADITYA ATUL	10
20ME108	HINDAVI TODKAR	12
20ME109	TRIPUTE AMEYA SUBHASH	13
20ME110	TUPSANDE YASH SADASHIV	AB
20ME116	ZOPE MOHIT JAYANT	11
21ME301	BADVE RISHIKESH PRAVIN	AB
21ME303	CHAVALE TEJAS TANAJI	AB
21ME305	DESAI MAYURESH ARVIND	AB
21ME307	DHORE KSHITIJ VITTHAL	2
21ME309	GUND VISHVAJEET	AB
21ME310	INGALE HARSHAL VIJAY	AB
21ME311	JAGTAP SIDDHARTH ASHOK	AB
21ME317	KUSUMKAR RAHUL	AB
21ME329	SAMPATE UDHHAV MAHADEV	5
21ME334	HARSHWARDHAN JAGANNATH VEER	11

Max Marks obtain :	**15**
Total Number of Student	**84**
Number of Students appeared	**29**
Number of student absent	**55**
Number of student passed	**5**
% of Passing	**17.24%**

Subject Teacher Dept. Academic Coordinator Head of Department

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name Yashraj Ravindra Patil Roll No.: 20ME076

Subject Composite Material Division : TE MechB

Examination Unit set II Day & Date : 27-4-23

Question No.	1	2	3	4	5	6	7	8	9	10	Total Marks
Marks	13		2								15

Examiner Signature

Q.1

a) Metal matrix composite (MMCs) can be classified based on the type of matrix & reinforcement material used. ~~Some Types of MMCs used~~ Classifications are:

1. Matrix Material:
   - Aluminum matrix composites.
   - magnesium matrix composites
   - Titanium matrix composites
   - Nickel matrix composites
   - Iron matrix composites.

2. Reinforcement material:
   - Ceramic matrix composites (CMCs)
   - Carbon matrix composites
   - Glass matrix composites (GMCs)
   - Metal matrix composites (MMCs)

3. Type of Reinforcement:
   - Particulate reinforced composites, Fiber reinfo

4) Direction of Reinforcement:

Unidirectional composites
Randomly oriented composites
Aligned composites.

- There can be many variations of MMCs depending on the specific combination of matrix & reinforcement materials, the manufacturing process used, & the desired properties of the composite material.

b- Powder metallurgy is widely used for fabricati MMCs - The process involves the mixing of metal powders with reforcement materials like ceramic particles, wisker or fibers, followed by compaction, sintering, & finishing operations. The reinforced material is uniformly dispersed throughout the matrix, resulting in a composite material with enhanced mechanical & physical properties.

- Steps involved in fabrication of MMCs:

1. Selection of MMCs: The first step in the powd metallurg process is to select the matrix, & reinforcement material.

2. Mixing of material: The metal powder metallurg process is to select the matrix materia & metal powder are mixed together in a ball mill or a high energy mill to ensure uniform distribution of reinforcement & matrix.

3. Compaction: The mixture is compacted under high pressure to form a green compact with desired shape & size. It can be done using a mechanical press or hydraulic press.

4. Sintering: The green compact is then sintered in a furnace at a temperature below the melting point of matrix. During sintering metal powder & matrix are bounded together.

5. Finishing: After sintering, the material is finished by machining, polishing, or coating to obtain the desired surface finish & dimensional accuracy.

- The powder metallurgy process can be optimized by controlling various parameters such as mixing time, compaction pressure, sintering temperature & time which affect quality of the final product.

Q. 4

a. Tensile testing of unidirection Compsites:

- It is a commonly used method to determine the mechanical properties of unidirectional composites, which are composites materials made of continuous fibers in a single direction embedded by applying a tensile force to the specimen in the direction of the fibers & measuring the resulting deformation.

- During testing, the unidirectional composite specimen is gripped at both ends with testing machine & pulled apart at a constant rate of deformation. The stress is calculated by dividing the force applied by cross sectional area.

2

SE Mech B 2023-24/I Solid Mechanics MMS

Department of Mechanical Engineering

S.E. Mechanical, Term I [2023-24]

Test: 1

SUBJECT: Solid Mechanics
Time: 01:00 pm to 02:00 pm Date: 03/10/2023 Class: SE
Sub. Code: 202041
Max Marks: 30

Instructions to the candidates:

- Answer Q1. Or Q2. Q.3 Or Q.4
- Figures to the right indicate full marks.
- Assume suitable data , if necessary

CO1 (202041.1): DETERMINE various types of stresses and strain developed on determinate and indeterminate members.
CO2 (202041.2): DRAW Shear force and bending moment diagram for various types of transverse loading and support.

Unit 1

Q.1. A In a tensile test on steel tube of external diameter 18 mm and internal diameter 10 mm, an axial pull of 2 kN produces stretch of 0.72×10^{-3} mm in a length of 100 mm and lateral contraction of 3.62×10^{-4} mm in outer diameter. **Determine** the values of three Modulii and Poisson's ratio of material. 7

Q.1. B A steel circular bar has three segments as shown in Fig. 1. **Determine**

i) the total elongation of the bar
ii) the length of the middle segment to have zero elongation of the bar. Take E=210 GPa. 8

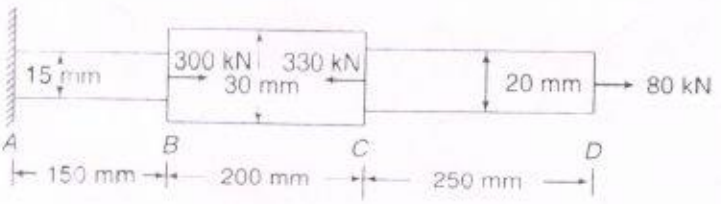


Fig. 1

OR

Q.2. A A rigid body AB weighing of 40 kN hangs from three wires of equal lengths as shown in Fig. 2. The middle wire is of steel and two outer wires are of copper. If cross-sectional area of each wire is 250 mm^2. **Determine** load shared by each wire. Take E_{st}=210 GPa. E_{cu}=105 GPa. 7

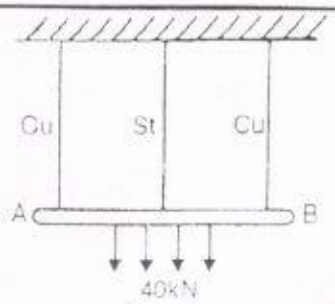


Fig. 2

Q.2. B A steel tube of 30-mm outer diameter and 25-mm inner diameter encloses a gunmetal rod of 20-mm diameter and is rigidly joined at each end. If at a temperature of 40°C there is no longitudinal stress, **determine** the stresses developed in the rod and the tube when the temperature of the assembly is raised to 240°C. Take $\alpha = 12 \times 10^{-6}$ per °C. 8

Unit 2

Q.3. A A beam of 5 m long and simply supported at each end, has a uniformly distributed load of 1000 N/m extending from left end to the point 2 m away. There is also a clockwise couple of 1000 N-m applied at the center of the beam. **Draw** SF and BM diagram for the beam. 7

Q.3. B **Draw** SF and BM diagram for the beam shown in Fig. 3 and **identify** the point of maximum bending moment. 8

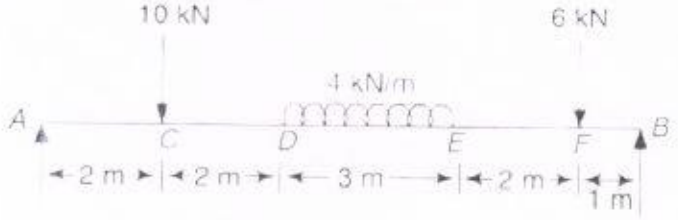


Fig. 3

OR

Q.4. A A cantilever of 14-m span carrying loads is shown in Fig. 4. **Draw** the shear force and bending moment diagrams. 7

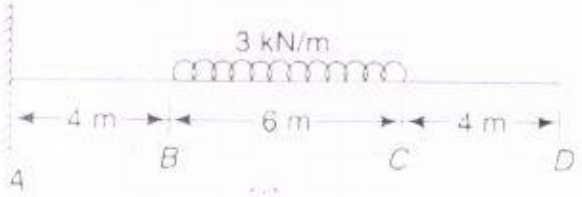


Fig. 4

Q.4. B A simply supported beam of 7-m span with overhangs rests on supports as shown in Fig. 5. **Draw** the shear force and bending moment diagrams. 8

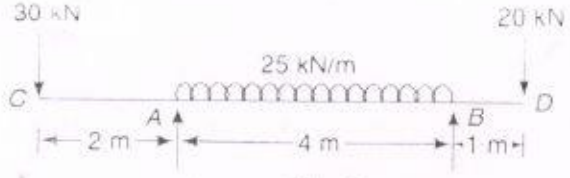


Fig. 5

Test: 1

SUBJECT: Solid Mechanics | Sub. Code: 202041

Unit 1

Q.1. A In a tensile test on steel tube of external diameter 18 mm and internal diameter 10 mm, an axial pull of 2 kN produces stretch of 6.72×10^{-3} mm in a length of 100 mm and lateral contraction of 3.62×10^{-4} mm in outer diameter. **Determine** the values of three Modulii and Poisson's ratio of material. 7

1A

D	18	mm
d	10	mm
P	2000	N
delta_L	6.72E-03	
L	100	mm
delta_D	3.62E-04	
A	175.9292	mm^2
E	PL/A/delta_L	
	169169.8	Mpa
E	169.1698	GPa
v	0.299272	
G	65.10174	GPa
K	140.4639	GPa

Q.1. B A steel circular bar has three segments as shown in Fig. 1. **Determine**

i) the total elongation of the bar

ii) the length of the middle segment to have zero elongation of the bar. Take E=210 GPa. 8

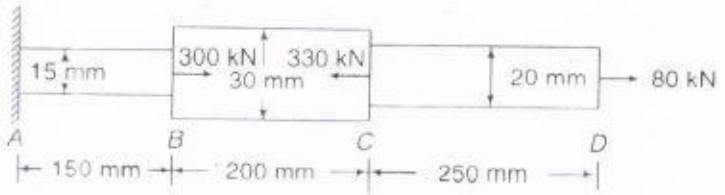


Fig. 1

1B

Total elongation	0.16841806	mm
Length of middle segment	300	mm

Q.2. A A rigid body AB weighing of 40 kN hangs from three wires of equal lengths as shown in Fig. 2. The middle wire is of steel and two outer wires are of copper. If cross-sectional area of each wire is 250 mm^2. **Determine** load shared by each wire. Take E_{St}=210 GPa, E_{Cu}=105 GPa. 7

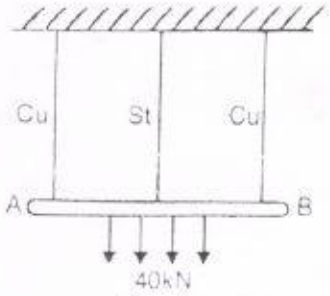


Fig. 2

2A

P_St	20	kN
P_Cu	10	kN

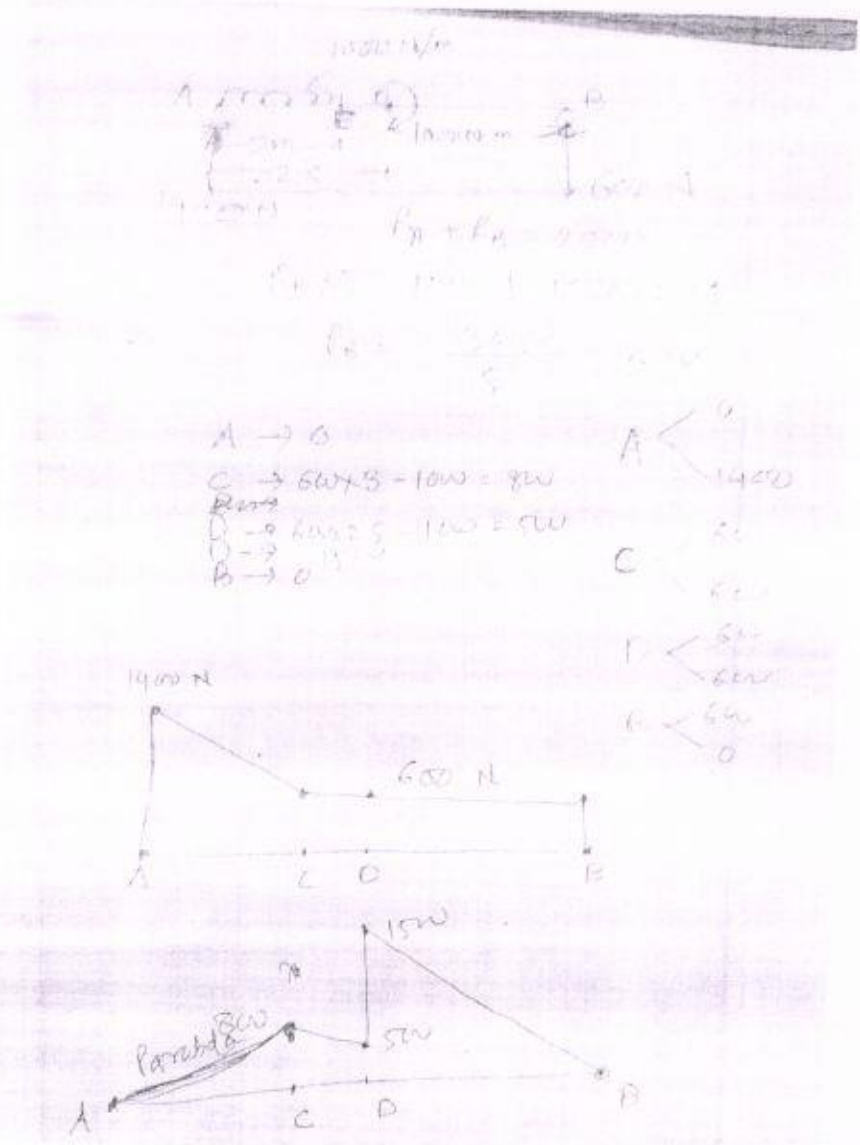
Q.2. B A steel tube of 30-mm outer diameter and 25-mm inner diameter encloses a gunmetal rod of 20-mm diameter and is rigidly joined at each end. If at a temperature of 40°C there is no longitudinal stress, **determine** the stresses developed in the rod and the tube when the temperature of the assembly is raised to 240 °C. Take α_{St}=12x10^{-6} per °C, α_{Gm}=18x10^{-6} per °C, E_{St}=205 GPa and E_{Gm}=92 GPa. 8

2B

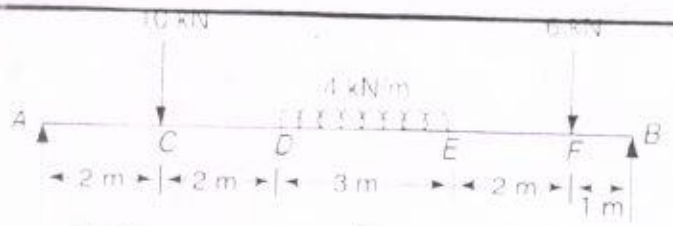
A_St	215.984495	mm^2
A_Gm	314.159265	mm^2
	0.0012	
	2.2585E-08	
	3.4599E-08	
P	20984.8611	N
sigma_St	97.1591092	MPa
sigma_Gm	66.7968876	MPa

Unit 2

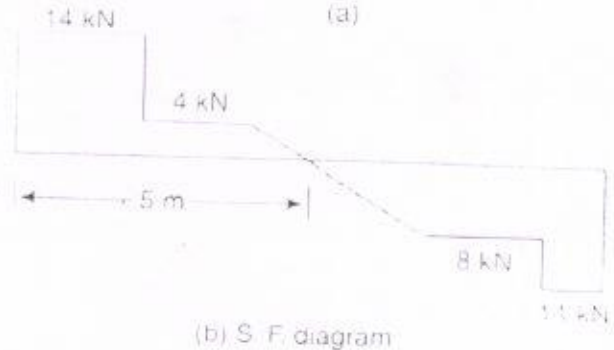
Q.3. A A beam of 5 m long and simply supported at each end, has a uniformly distributed load of 1000 N/m extending from left end to the point 2 m away. There is also a clockwise couple of 1000 N-m applied at the center of the beam. **Draw** SF and BM diagram for the beam. 7



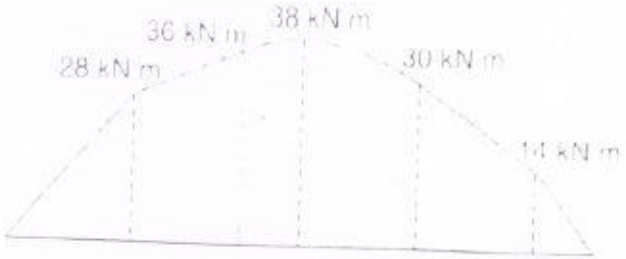
Q.3. B **Draw** SF and BM diagram for the beam shown in Fig. 3 and **identify** the point of maximum bending moment. 8



(a)



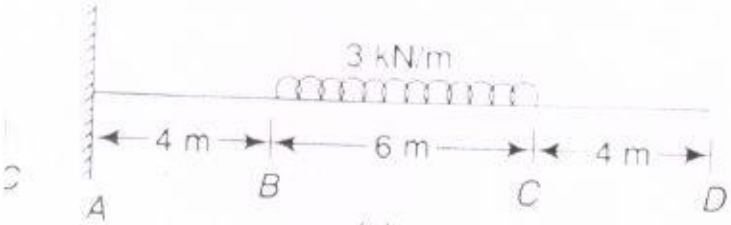
(b) S. F. diagram



(c) B. M. diagram

OR

Q.4. A A cantilever of 14-m span carrying loads is shown in Fig. 4. **Draw** the shear force and bending moment diagrams. 7

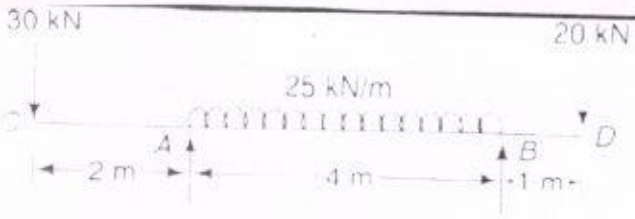


(c)

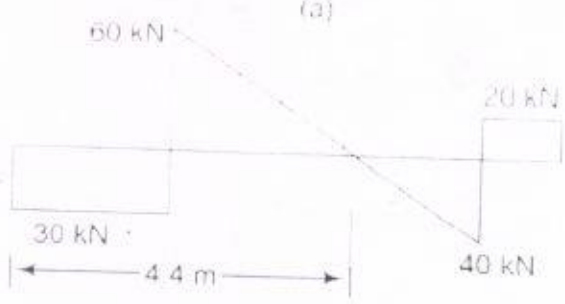
S. F. diagram

B. M. diagram

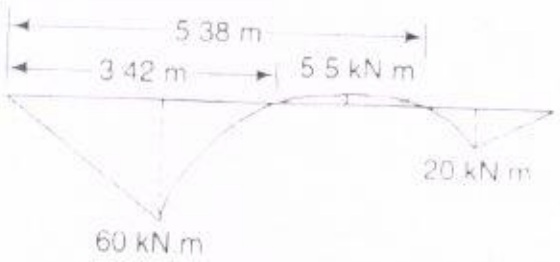
Q.4. B A simply supported beam of 7-m span with overhangs rests on supports as shown in Fig. 5. **Draw** the shear force and bending moment diagrams. 8



(a)



(b) S. F diagram



(c) B. M. diagram

AISSMS
COLLEGE OF ENGINEERING

ज्ञानम् सकलजनहिताय

Accredited by NAAC with "A+" Grade

Department of Mechanical Engineering

S.E. Mechanical, Term I [2023-24]

Test: 1

SUBJECT: Solid Mechanics
Time: 01:00 pm to 02:00 pm **Date: 03/10/2023** **Class: SE** **Sub. Code: 202041**
Max Marks: 30

Instructions to the candidates:

- Answer Q1. Or Q2. Q.3 Or Q.4
- Figures to the right indicate full marks.
- Assume suitable data , if necessary

CO1 (202041.1): DETERMINE various types of stresses and strain developed on determinate and indeterminate members.
CO2 (202041.2): DRAW Shear force and bending moment diagram for various types of transverse loading and support.

Unit 1

Q.1. A In a tensile test on steel tube of external diameter 18 mm and internal diameter 10 mm, an axial pull of 2 kN produces stretch of 3.36×10^{-3} mm in a length of 100 mm and lateral contraction of 1.81×10^{-4} mm in outer diameter. **Determine** the values of three Modulii and Poisson's ratio of material. 7

Q.1. B A steel circular bar has three segments as shown in Fig. 1. **Determine**

i) the total elongation of the bar
ii) the length of the middle segment to have zero elongation of the bar. Take E=210 GPa. 8

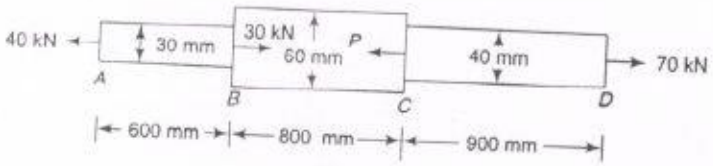
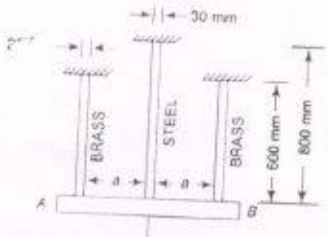


Fig. 1

OR

Q.2. A Three equally spaced rods in the same vertical plane support a rigid bar AB. Two outer rods are of brass, each 600 mm long and of 25 mm in diameter. The central rod is of steel that id 800 mm long and 30 mm in diameter. Determine the forces in the rods due to an applied load of 120 kN through the mid-point of the bar. The bar remains horizontal after the application of the load. Take $E_s/E_b=2$. 7



Q.2. B A steel tube of 30-mm outer diameter and 25-mm inner diameter encloses a gunmetal rod of 20-mm diameter and is rigidly joined at each end. If at a temperature of 40°C there is no longitudinal stress, **determine** the stresses developed in the rod and the tube when the temperature of the assembly is raised to 180°C. Take $\alpha=12\times10^{-6}$ per °C. 8

Unit 2

Q.3. A A beam of 5 m long and simply supported at each end, has a uniformly distributed load of 1000 N/m extending from left end to the point 1.5 m away. There is also a clockwise couple of 1000 N-m applied at the center of the beam. **Draw** SF and BM diagram for the beam. 7

Q.3. B **Draw** SF and BM diagram for the beam shown in Fig. 3 and **identify** the point of maximum bending moment. 8

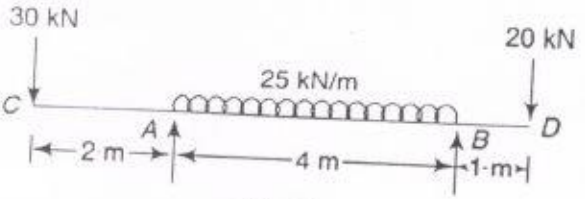


Fig. 3

OR

Q.4. A A cantilever of 14-m span carrying loads is shown in Fig. 4. **Draw** the shear force and bending moment diagrams. 7

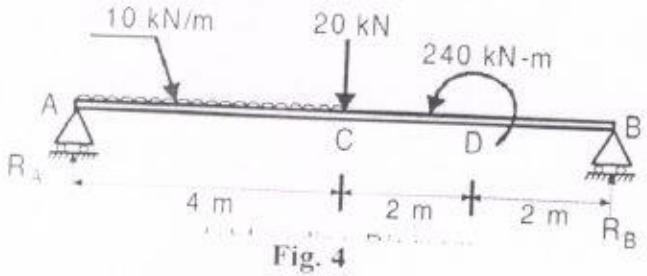


Fig. 4

Q.4. B **Draw** SF and BM diagram for the beam shown in Fig. 5 and **identify** the point of maximum bending moment. 8

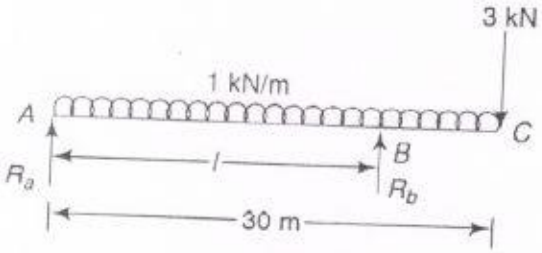


Fig. 5

Test: 1

SUBJECT: Solid Mechanics **Sub. Code: 202041**

Unit 1

Q.1. A In a tensile test on steel tube of external diameter 18 mm and internal diameter 10 mm, an axial pull of 2 kN produces stretch of 3.36×10^{-3} mm in a length of 100 mm and lateral contraction of 1.81×10^{-4} mm in outer diameter. **Determine** the values of three Modulii and Poisson's ratio of material. 7

1A

D	18	mm
d	10	mm
P	2000	N
delta_L	3.36E-03	mm
L	100	mm
delta_D	1.81E-04	mm
A	175.9292	mm^2
E	PL/A/delta_L	
	338339.6	Mpa
E	**338.3396**	**GPa**
v	**0.299272**	
G	**130.2035**	**GPa**
K	**280.9278**	**GPa**

Q.1. B A steel circular bar has three segments as shown in Fig. 1. **Determine**

i) the total elongation of the bar

ii) the length of the middle segment to have zero elongation of the bar. Take E=210 GPa. 8

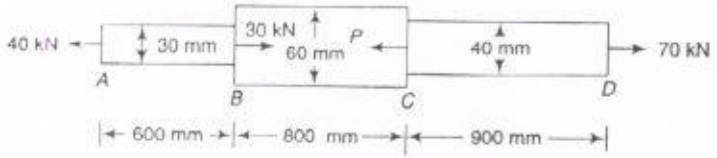


Fig. 1

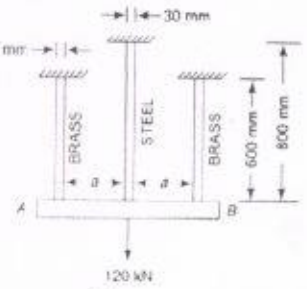
1B

Total elongation	0.4139	mm
Length of middle segment	300	mm

OR

Q.2. A Three equally spaced rods in the same vertical plane support a rigid bar AB. Two outer

the application of the load. Take $E_s/E_b=2$.



2A

P_St	62.3	kN
P_Br	28.84	kN

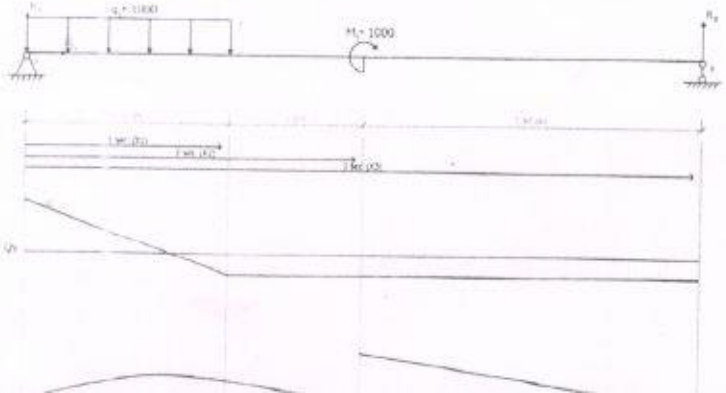
Q.2. B A steel tube of 30-mm outer diameter and 25-mm inner diameter encloses a gunmetal rod of 20-mm diameter and is rigidly joined at each end. If at a temperature of 40°C there is no longitudinal stress, **determine** the stresses developed in the rod and the tube when the temperature of the assembly is raised to 240°C. Take $\alpha_{St}=12\times10^{-6}$ per °C, $\alpha_{Gm}=18\times10^{-6}$ per °C, $E_{St}=205$ GPa and $E_{Gm}=92$ GPa. **8**

2B

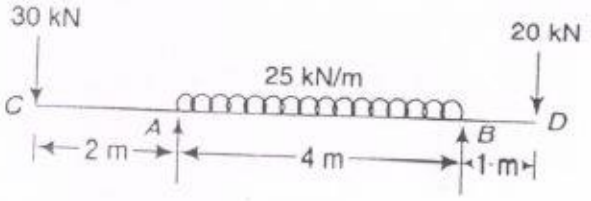
A_St	215.984495	mm^2
A_Gm	314.159265	mm^2
	0.0012	
	2.2585E-08	
	3.4599E-08	
P	20984.8611	N
sigma_St	97.1591092	MPa
sigma_Gm	66.7968876	MPa

Unit 2

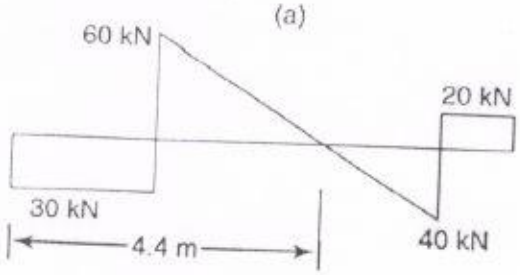
Q.3. A A beam of 5 m long and simply supported at each end, has a uniformly distributed load of 1000 N/m extending from left end to the point 1.5 m away. There is also a clockwise couple of 1000 N-m applied at the center of the beam. **Draw** SF and BM diagram for the beam. **7**



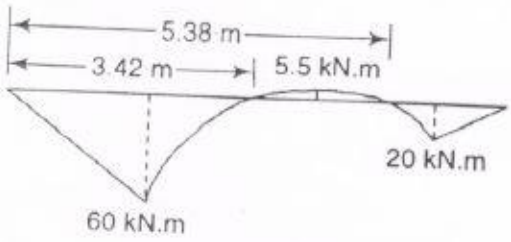
Q.3. B **Draw** SF and BM diagram for the beam shown in Fig. 3 and **identify** the point of maximum bending moment. 8



(a)



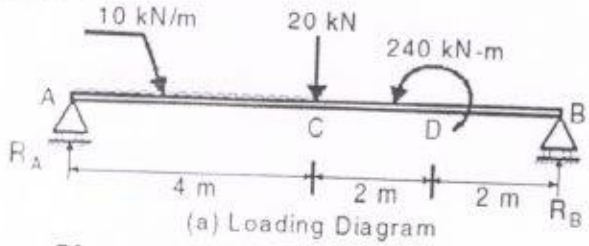
(b) S. F. diagram



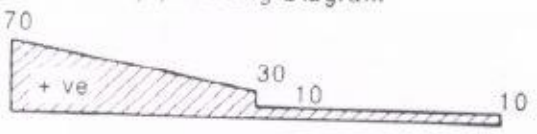
(c) B. M. diagram

OR

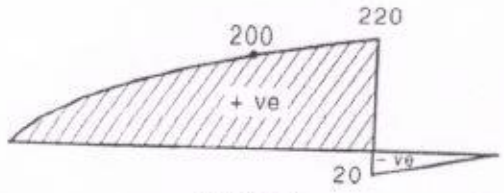
Q.4. A A cantilever of 14-m span carrying loads is shown in Fig. 4. **Draw** the shear force and bending moment diagrams. 7



(a) Loading Diagram

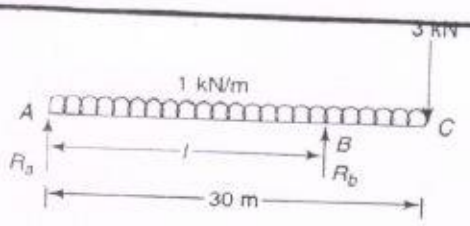


(b) SFD

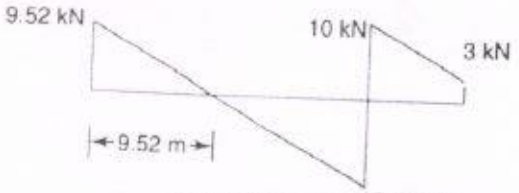


(c) BMD

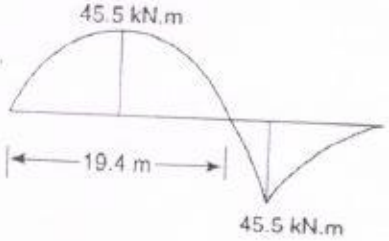
Q.4. B **Draw** SF and BM diagram for the beam shown in Fig. 5 and **identify** the point of maximum bending moment. 8



(a)



(b) S. F. diagram



AISSMS
COLLEGE OF ENGINEERING

Department of Mechanical Engineering

Vision

"To be recognized as a premier center in the field of Mechanical Engineering Education"

Academic Year : 2023-24 (Term I)

Unit Test : I

Room No: 419 Sub: Solid Mechanics

Class : SE (Mechanical) B

Date : 03·10·2023 Marks 30

Attendance list

Sr No	Roll No	Name of the Student	Signature	
1	22ME070	KIRVE MUGDHA KISHOR		03
2	22ME072	KULKARNI AKHILESH SUDHAKAR		06
3	22ME073	KULKARNI ATHARVA BHASKAR (TFWS)		13
4	22ME074	KULKARNI ATHARVA GAJANAN		
5	22ME075	KULKARNI MANAS NIVAS		15
6	22ME078	KUSPE RAJESH AVINASH		07
7	22ME079	LANDE ANKIT VIJAY		00
8	22ME080	MANE SHIVAJI MOHAN (TFWS)		13
9	22ME081	MANE VIVEK ANIL		12
10	22ME082	MARATHE VARUN RAJIV (TFWS)		08
11	22ME083	MATE VAISHNAVI DEEPCHAND	AB	
12	22ME084	MATWANKAR MANAV DASHRATH		15
13	22ME085	NALAWADE ANUSHKA NAMDEO		04
14	22ME086	NANOTE AVANTI SUDHAKAR		00
15	22ME088	NIRGUDE JATIN AJIT		02
16	22ME089	OM MAHENDRA ABNAVE		02
17	22ME090	OTARI TANAYA RAHUL		13
18	22ME091	PARAKH AMAN SWAPNIL		06
19	22ME093	PARDESHI OM NITIN		08
20	22ME094	PATEL ARISH JAVED	AB	
21	22ME095	PATIL AARYAN VIDYADHAR		07
22	22ME096	PATIL ABHAY SAHEBRAO		02
23	22ME099	PATIL SAMAR DHANRAJ		03
24	22ME101	PAWAR ABHIJEET BALU	AB	
25	22ME102	PAWAR ATHARV DHANANJAY	AB	
26	22ME103	PAWAR SARTHAK VIJAY		03
27	22ME105	PIMPARKAR SARANG PRAMOD		04
28	22ME107	SALUNKHE MIHIR DINESH		05
29	22ME108	SATAV KARTIK MEGHSHAM		05
30	22ME109	SAYED ABUBAKAR EJAJ		05
31	22ME110	SHAIKH MEHAK ALTAF		06
32	22ME111	SHEDGE VINAY VIVEK	AB	
33	22ME112	SHINDE VASUDHA MAROTI		10
34	22ME113	SHITOLE JATIN VILAS		00
35	22ME114	SHIVRAJ SANJAY KADAM		11
36	22ME116	SONAWANE VAISHNAVI SUNIL		17

Total No of students : 36

Total No of studentsAbsent : 06

Total No of students Presents : 30

Name & Sign of

Jr supervisor Dept. Academic Coordinator Exam coordinator

DR M M Sayyad

AISSMS
COLLEGE OF ENGINEERING

ज्ञानम् सकलजनहिताय

Accredited by NAAC with "A+" Grade

Department of Mechanical Engineering

Vision

"To be recognized as a premier center in the field of Mechanical Engineering Education"

Academic Year : 2023-24 (Term I)

Unit Test : I

Room No: 419 Sub: Solid Mechanics

Class : SE (Mechanical) B

Date : 09/10/2023

Marks 30

Attendance list

Sr No	Roll No	Name of the Student	Signature	
37	22ME118	SONKAMBLE MAYUR BHIMDEEP	Mayur	05
38	22ME119	SURSE PANKAJ SANJAY	AB	
39	22ME120	SUTHAR SAWAILAL SAVLARAM	Sawailal	13
40	22ME121	TAMBE OM CHANDRAKANT		03
41	22ME122	TARKASH SYNYAAN MUBASHIR (EWS)	Stark	04
42	22ME123	TIGOTE OMKAR VIKRANT	Omkar	14
43	22ME124	UPADHYE ARIHANT SHANTINATH		11
44	22ME125	WAGHMODE DIGVIJAY SHRIKRISHNA	Waghmode	00
45	22ME126	WAWARE ARYAN AJAY	Waware	12
46	22ME127	YASH BODADE	AB	
47	23ME301	AADITYA HARSHAL THORVE	Aaditya	
48	23ME302	ABHISHEK VIJAY GHATGE (EWS)		00
49	23ME303	AMBATKAR SANKET SADANAND	AB	00
50	23ME304	AMEY YADAV	AB	Amey 09
51	23ME305	BHOSALE BHAVESH JAYAVANTRAO		02
52	23ME306	DESHMUKH KARTIK SATISH (EWS)	AB	
53	23ME307	DIVYESH SHIRBHATE	AB	
54	23ME308	GHODAKE TEJAS KAILAS		11
55	23ME309	HIRE MITANSHU RAVINDRA (EWS)		00
56	23ME310	JAMADAR MUJJAMIL ABDUL		00
57	23ME311	KUNTE KARAN RENUBA	AB	
58	23ME312	NIKAM JANHAVI DEVIDAS		00
59	23ME313	PATIL AVISHKAR JAYAWANT	Patil	05
60	23ME314	SAMARTH MANE		02
61	23ME315	SASANE PRAJWALIT GAUTAM		08
62	23ME316	SATYAM VINOD CHAUDHARI		02
63	23ME317	SHENDGE TEJAS ASHOK		03
64	23ME318	SHILWANT PRAJAKTA VIJAYKUMAR	AB	
65	23ME319	SHINDE AJIT SANJAY		12
66	23ME320	SHREYAS RAMAKANT CHAUDHARI		07
67	23ME321	SWAN MANISH RAJESHRAO		12
68	23ME322	VARAD GHULE		01
69	23ME323	YADAV RUCHI GOP VIRENDRA		00
70	23ME324	ZURANGE OM NISHANT		01
71	23ME301	Aditya Vasu Malsade		

Total No of students : 31

Total No of studentsAbsent : 08

Total No of students Presents : 96

Name & Sign of Jr supervisor

Dept. Academic Coordinator

Exam coordinator

BS MM Sayyad

AY 2023-24 Term I

SE Mech B

Unit Test - I

Solid Mechanics

Marks - 30

3/10/2023

Sl.No.	Roll No.	Name of student	Signature	Marks
1)	22ME018	Akhilesh Kulkarni		06
2)	22ME078	Rajesh Kuspe		07
3)	22ME112	Vasudha M. Shinde		10
4)	22ME110	Mehak A. Shaikh		06
5)	22ME109	Abubakar Sayyed		05
6)	22ME029	Anikt Vijay Lunde		00
7)	MED2317	Mujjamil Jamadar		02
8)	Susane Prajwalit Gautam			02
9)	MED2305	Manish R. Sucan		12
10)	MED2304	Avishkar J. Patil		05
11)	22ME070	Mugdha Kirve		03
12)	22ME090	Tanaya Otari		13
13)	22ME084	Manav Matwankar		15
14)	22ME123	Omkar Tigote		14
15)	MED2326	Janhavi Nikam		00
16)	MED2301	Ruchi Gop Yadav		00
17)	MED2318	Varad R. Ghule		01
18)	MED2319	Aaditya Thorve		03
19)	MF085	Anushka Nalawade		04
20)	22ME086	Avanti Nanote		00
21)	22ME073	Atharva B. Kulkarni		13
22)	22ME120	Sawaikal Sudhar		13
23)	22ME116	Vaishnavi Sonawane		17
24)	22ME099	Samar Patil		03
25)	22ME095	Aaryan Patil		07
26)	22ME107	Mihir Salunkhe		

SE Mech B

AY 2023-24 Term I

Unit Test - I

Solid Mechanics

Marks - 30

3/10/2023

Sr No.	Roll No.	Name of Student	Signature	Marks
1.	MED 2323	Mitanshu R Hire		00
2	ME-D2321	Ajit S. Shinde		12
3	ME-D2311	Tejas K. Ghadake		11
4	ME-D2306	Satyam V. Chaudhari		02
5	ME-D2315	Shreyas R. Chaudhari		07
6	22ME125	Waghmode Digvijay S.		00
7.	22ME113	Jatin V. Shitole.		00
8.	22ME114	Shivraj S. Kadam		11
9.	22ME107	Mihir Salunkhe		05
10.	22ME096	Abhay S. Patil		02
11.	22ME118	Mayur B. Sonkamble		05
12.	22ME103	Sarthak Pawar		03
13.	22ME105	Sarang P. Pimparkar		04
14.	22ME093	Om N. Pardeshi		08
15.	22ME122	Synyaan M Tarkash		04
16.	22ME091	Aman S. Parakh		06
17.	22ME082	Varun R. Marathe		08
18.	22ME075	Manas N. Kulkarni		15
19.	22ME124	Aniket G. Upadhye		11
20.	22ME080	Shivaji Mane		13
21.	22ME081	Vivek Mane		12
22.	22MED2320	Abhishek Ghatge		00
23	ME D2312	Bhavesh Bhosale		02
24	22ME108	Kartik M. Satav		05
25.	22ME126	Aryan A. Wavare		12
26.	22ME121	Tambe Om Chandrakant		03
27.	22MED2303	Samarth Y. Mane		02
28.	MS-D2336.	Om. N. Zurange.		01

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name Mane Shivaji Mohan Roll No.: 22ME080

Subject Solid Mechanics Division : SE MECH-B

Examination Unit test-I Day & Date : 03/10/2023

Question No.	1	2	3	4	5	6	7	8	9	10	Total Marks
Marks	8	—	5								13

Examiner Signature

Q.1

A] Given :- $d_2 = 18\ mm$

$d_1 = 10\ mm$

$P = 2\ KN$

$\delta L = 3.36 \times 10^{-3}\ mm$

$L = 100\ mm$

$\delta d = 1.81 \times 10^{-4}\ mm$

To Find :- i) $\mu = ?$

ii) $E = ?$

iii) $G = ?$

iv) $K = ?$

Solution :-

$\mu = \dfrac{\text{Lateral strain}}{\text{Linear strain}}$

$\dfrac{\delta d}{}$

$$\mu = \frac{1.81 \times 10^{-4}}{18} \times \frac{100}{3.36 \times 10^{-3}}$$

$$\therefore \mu = 0.299$$

Here,

$$\delta L = \frac{PL}{AE}$$

$$E = \frac{PL}{A\delta L}$$

$$E = \frac{2 \times 10^3 \times 100}{\frac{\pi}{4}(18^2 - 10^2) \times 3.36 \times 10^{-3}}$$

$$\therefore E = 338.339 \text{ KN/mm}^2$$

From E & K relation, we get

$$E = 3K(1 - 2\mu)$$

$$K = \frac{E}{3(1 - 2\mu)}$$

$$K = \frac{338.339 \times 10^3}{3 \times (1 - 2 \times 0.299)}$$

$$\therefore K = 280.546 \text{ KN/mm}^2$$

$$E = 2G(1+\mu)$$

$$G = \frac{E}{2(1+\mu)}$$

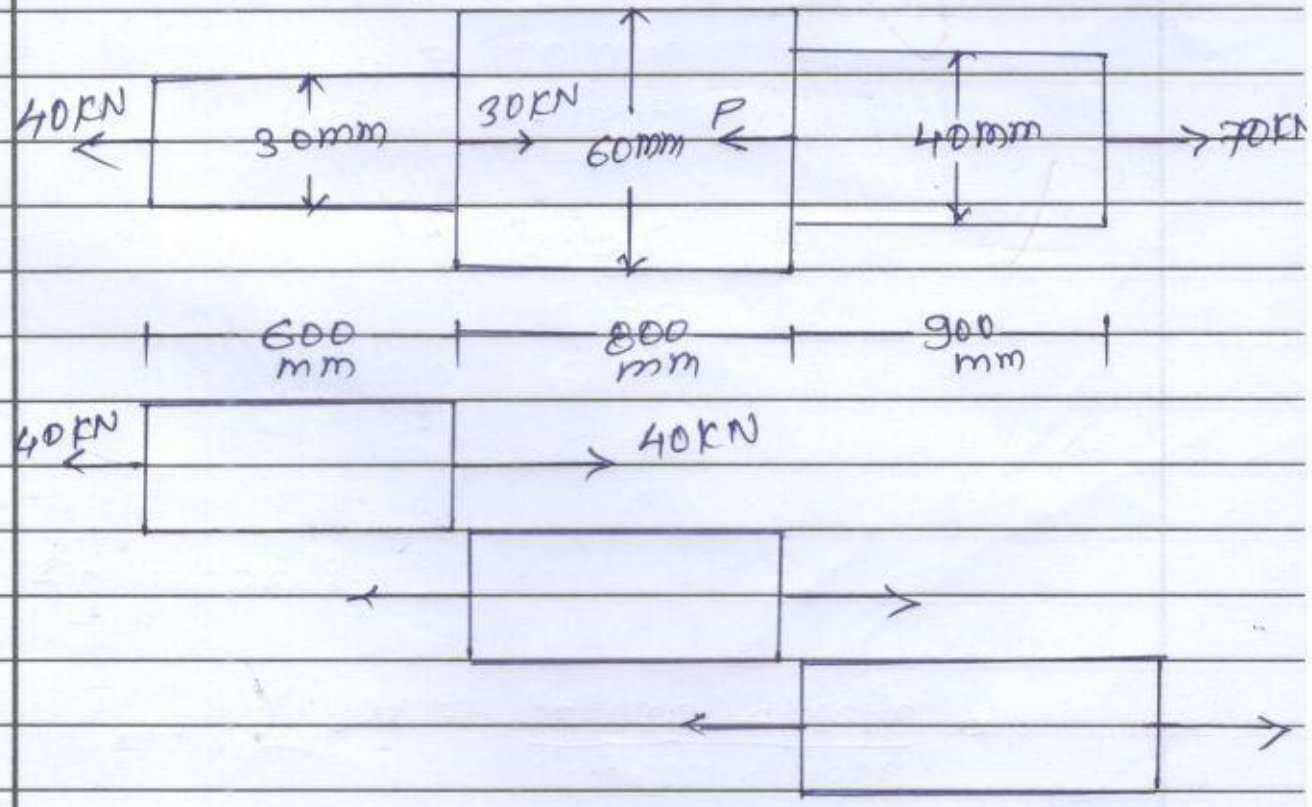
$$G = \frac{338.339 \times 10^3}{2(1+0.299)}$$

$$\therefore G = 130.23 \text{ KN/mm}^2$$

B] Given :- $E = 210 \text{ GPa} = 210 \times 10^3 \text{ N/mm}^2$

To Find :- i) $\delta L = ?$

ii)



For Body (1)

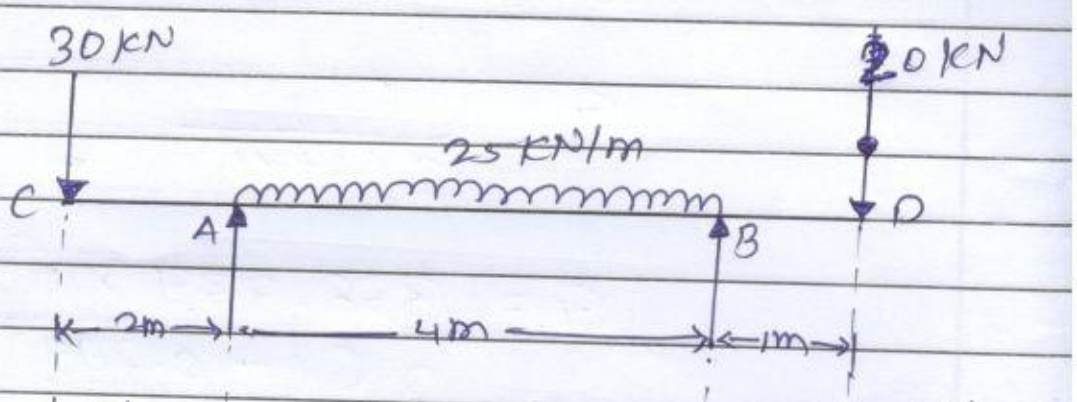
$$\delta L = \delta L_{AB} + \delta L_{BC} + \delta L_{CD}$$

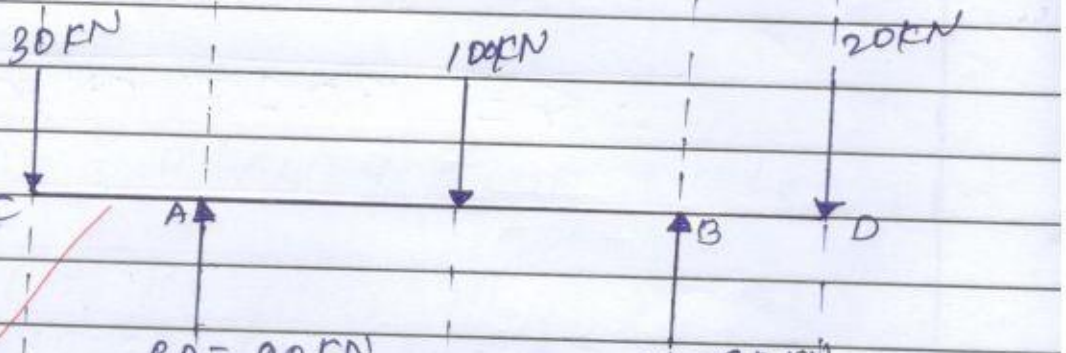
$$\delta L = \frac{PL}{AE}\Big|_{AB} + \frac{PL}{AE}\Big|_{BC} + \frac{PL}{AE}\Big|_{CD}$$

$$\delta L = \frac{1}{E}\left[\left(\frac{PL}{A}\right)_{AB} + \left(\frac{PL}{A}\right)_{BC} + \left(\frac{PL}{A}\right)_{CD}\right]$$

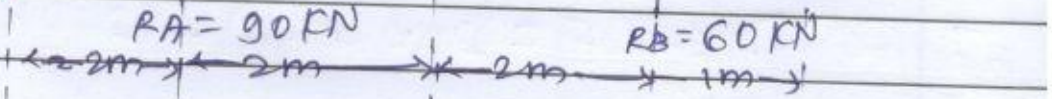
Q.3

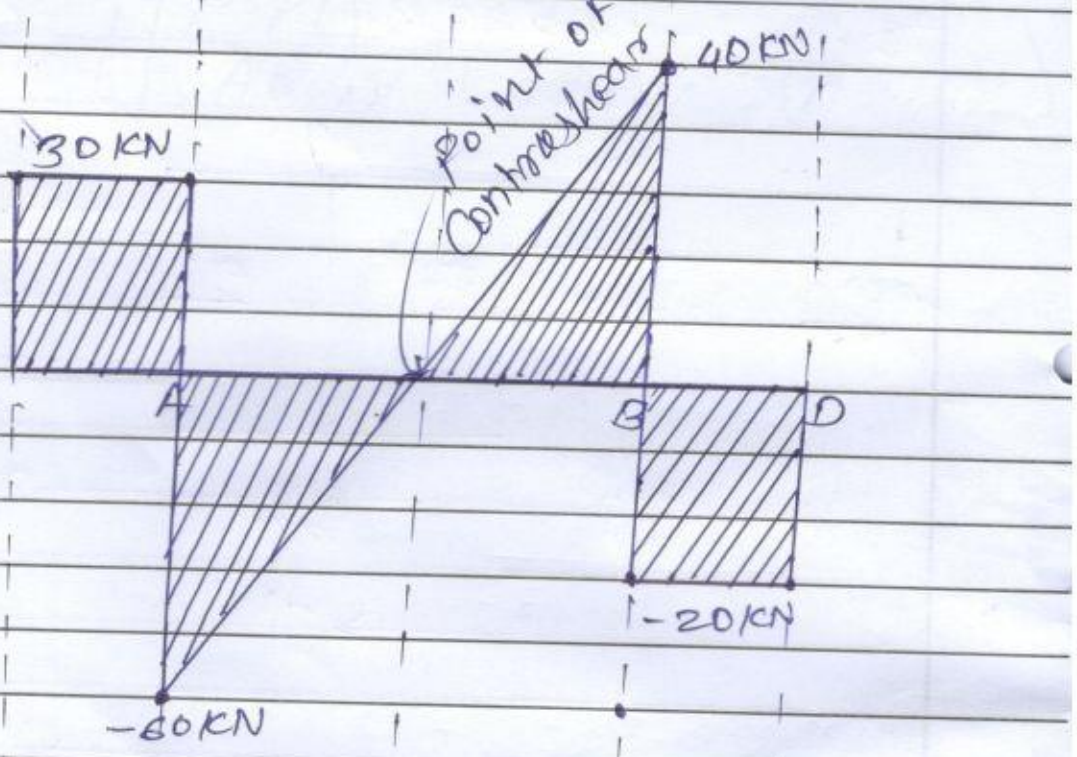
B]





FBD ⇒





SFD ⇒

BMD ⇒

$R_A + R_B = 150\ KN$

$\Sigma M_A = 0 \Rightarrow -30 \times 2 + 2 \times 100 + 5 \times 20 = 4R_B$

$\therefore R_B = 60\ KN$

$\therefore R_A = 90\ KN$

SF Calculation →

SF. Just B.C $= -30 + 90 - 100 + 60 - 20 = 0$

SF. Just A.C $= +90 - 100 + 60 - 20 = 30\ KN$

SF. Just B.A $= 90 - 100 + 60 - 20 = 30\ KN$

SF. JustA.A $= -100 + 60 - 20 = -60\ KN$

SF. Just B.B $= 60 - 20 = 40\ KN$

SF. Just A.B $= -20\ KN$

SF. Just B.D $= -20\ KN$

SF. Just A.D $= 0$

BM Calculation ⇒

BM at A $= 2 \times 90 + 4 \times 100 - 6 \times 60 + 7 \times 20$

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name Atharva B. Kulkarni Roll No.: 22ME073

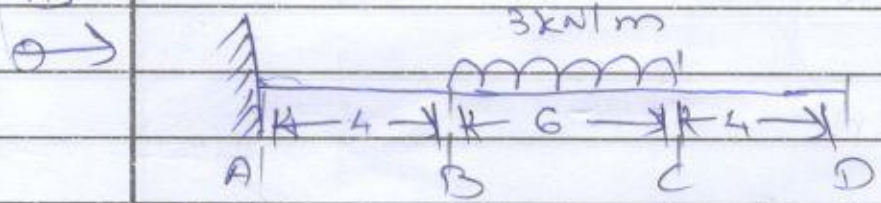
Subject SM Division : Mech-B

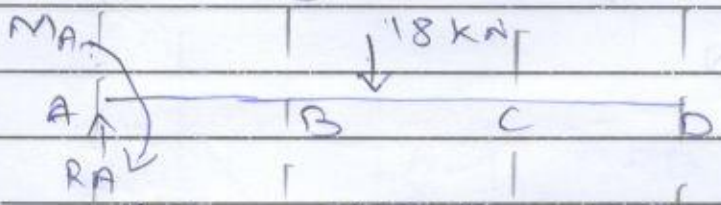
Examination Unit - I Day & Date : 3-08-23

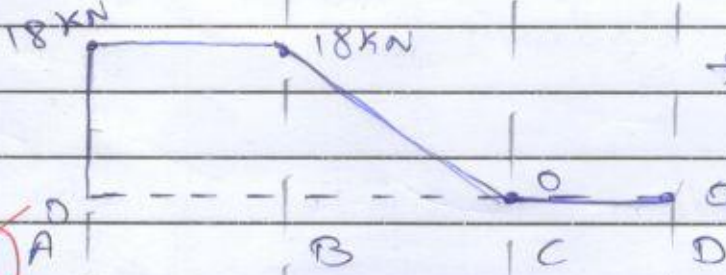
Question No.	1	2	3	4	5	6	7	8	9	10	Total Marks
Marks	—	1	—	12	—						13

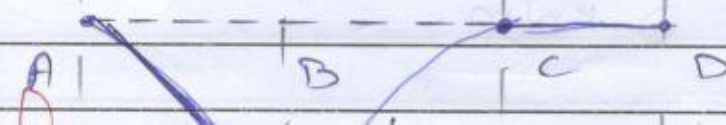
Examiner Signature

2.4









$\Sigma F_y = 0$

$R_A = 18$ KN

$\Sigma M = 0$

$M_A = -18 \times 7$

$\Sigma M_A = 126$ KN.m

SF calculation

J.B.A = 0 KN

J.A.A = 18 KN

J.B.B = 18 KN

J.A.B = 18 KN

J.B.C = 0 KN

J.A.C = 0 KN

J.B.D = 0 KN

J.A.D = 0 KN

BM calculation

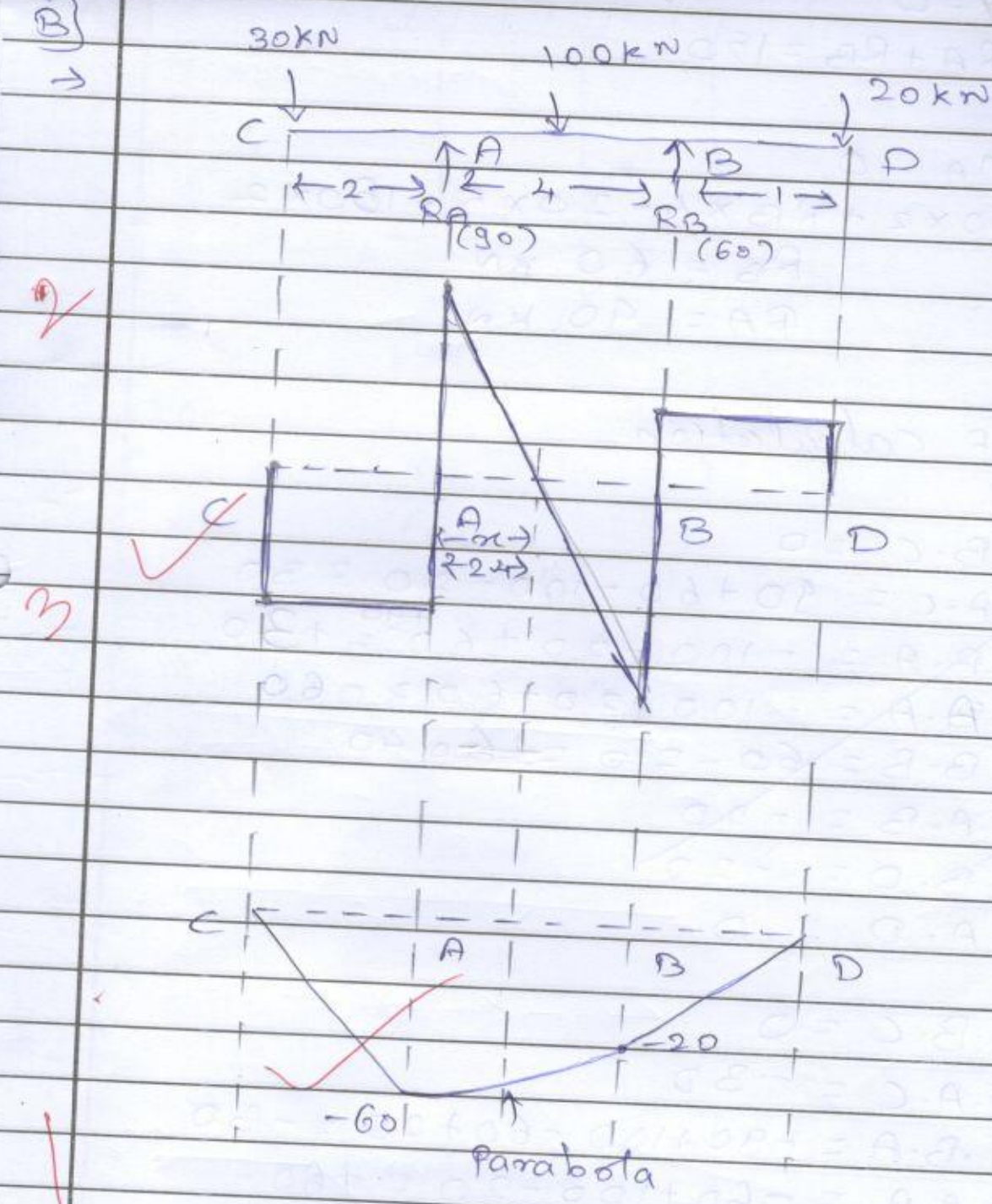
BM at A = 0 KNm

BM at B = $-18 \times 3 = -54$ KNm

Bm at C = 0 KNm

BM at D = 0 KNm

B)


30kN
100kN
20kN
C
A
B
D
2
4
1
RA (90)
RB (60)
C
A
x
2-2x
B
D
C
A
B
D
-20
-60
Parabola

$x = 2.4$

$\Sigma F_Y = 0 \quad (+\uparrow -\downarrow)$

$R_A + R_B = 150$

$\Sigma M_A = 0$

$30 \times 2 + R_B \times 4 - 20 \times 5 - 100 \times 2$

$R_B = 60$ kN

$R_A = 90$ kN

SF calculation

J.B.C = 0

J.A.C = 90 + 60 - 100 - 20 = 30

J.B.A = -100 - 20 + 60 +90 = +30

J.A.A = -100 - 20 + 60 = -60

J.B.B = 60 - 20 = 40

J.A.B = -20

J.B.D = -20

J.A.D = 0

J.B.C = 0

J.A.C = -30

J.B.A = -90 + 100 - 60 + 20 = -30

J.A.A = -60 + 100 - 20 = +60

J.B.B = -40

J.A.B = 20

J.B.D = 20

J.A.D = 0

BM calculation

BM at C = 0

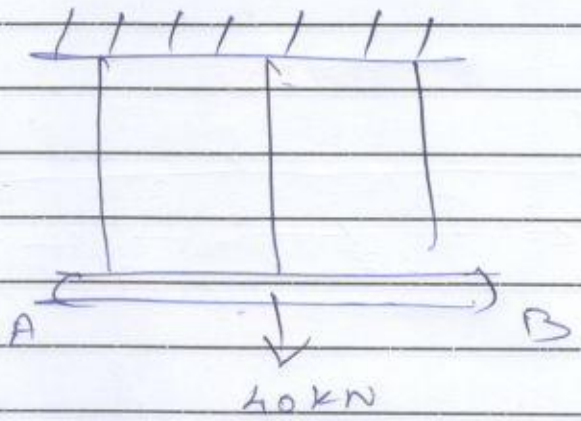
BM at A = $-100 \times 2 + 60 \times 4 - 20 \times 5 = -6$

BM at B = -20

Q 2

A)

→



Formula :-

$$\delta L = \frac{PL}{AE}$$

$$\delta L = \frac{40 \times 10^3 \times}{250 \times 105 \times 10^3}$$

PRATAP CHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name Omkar Tigote. Roll No.: 22ME123.

Subject Un Solid Mechanics. Division: Mech B Batch C.

Examination Unit Test Day & Date: 3/10/23.

Question No.	1	2	3	4	5	6	7	8	9	10	Total Marks
Marks	7	—	7	—							14

Examiner Signature

Unit 1.

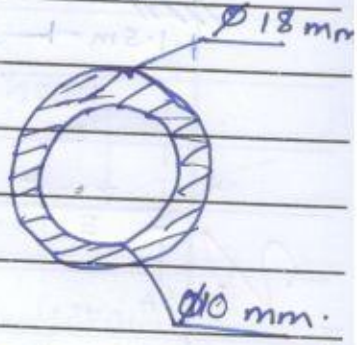
Q1 A

$\delta L = 3.36 \times 10^{-3}$ mm.

$L = 100$ mm.

$P = 2$ KN.

$\delta d = 1.81 \times 10^{-4}$ mm.



$\varepsilon_{lin} = \frac{\delta L}{L} = \frac{3.36 \times 10^{-3}}{100} = 3.36 \times 10^{-5}$

$\sigma = \frac{P}{A} = \frac{2000}{\frac{\pi}{4}(18^2 - 10^2)} = 11.36 \text{ N/mm}^2$

① $E = \frac{\sigma}{\varepsilon_{lin}} = \frac{11.36 \text{ N/mm}^2}{3.36 \times 10^{-5}} = 338.09 \times 10^3$

338.09 GPa.

$\varepsilon_{lat} = \frac{\delta d_{outer}}{d_{outer}} = \frac{1.81 \times 10^{-4}}{18} = 10.05 \times 10^{-6}$.

② $\therefore \nu = \frac{\varepsilon_{lat}}{\varepsilon_{lin}} = \frac{10.05 \times 10^{-6}}{3.36 \times 10^{-5}} = 0.29$

$E = 2G(1+\nu)$

$G = 131.042$.

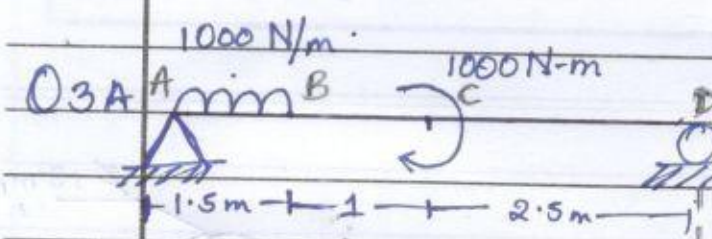
③ $G = 131.04$ GPa.

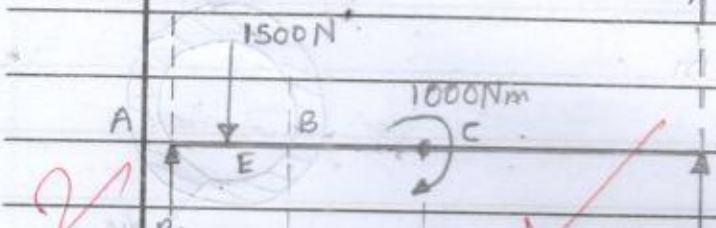
$E = 3K(1-2\nu)$

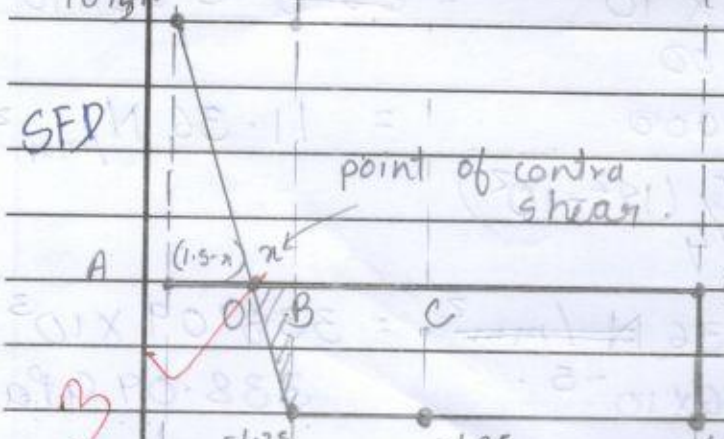
$338.09 \times 10^3 = 3K(1-2(0.29))$

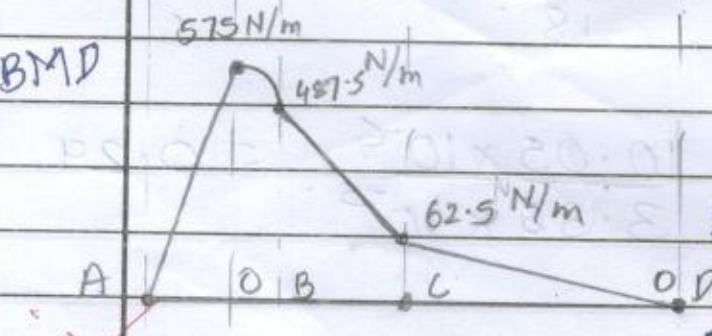
④ $K = 268.32$ GPa.

Unit 2.









$\Sigma F_y = 0 \Rightarrow R_A + R_D = 1500$

$\Sigma M_A = 0 \Rightarrow (R_D \times 5) - 1000 - (150$

$R_D = 425$ N.

$R_A = 1075$ N.

SF calculation.

SF Before A = 0.

SF Af A = $-425 + 1500 = 1075$

SF Bef B = $-425 + 1500 = 107$ ~~-425~~

SF Af B = -425.

SF Bef C = -425

SF Af C = -425.

SF Bef D = -425 $\frac{1075}{(1.5-x)} = \frac{425}{x}$

SF Af D = 0.

$x = 0.425$.

BM calculation.

BM at A = $(425 \times 5) - 1000$ $-(1500 \times 0.7$

= 0.

BM at O = $(425 \times 3.92) - 1000$

$- (425 \times \frac{1}{2} \times 0.425)$

= 575 N/m^2

BM at B = $(425 \times 3.5) - 1000$

= 487.5 N/m.

BM Befor C = $(425 \times 2.5) - 1000$

BM at P = 0

TE/SI4 2022-23 Term I
QP, MS, MS, Assignment

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Accredited by NAAC with "A+" Grade

Department of Mechanical Engineering

T.E. Mechanical/Mech. Sandwich, Term I [2022-23]

Test: 1

SUBJECT: Numerical & Statistical Methods **Sub. Code: 302041**

Time: 1 Hour **Date : 22/08/2022**

Class : TE Mech A&B and Mech Sand. **Max Marks: 30**

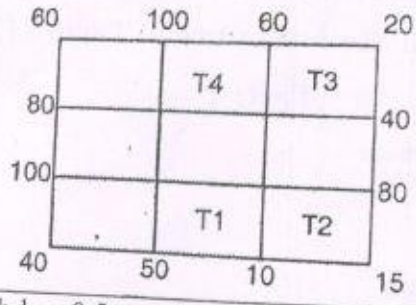
Instructions to the candidates:
- Answer Q1. Or Q2. Q.3 Or Q.4
- Figures to the right indicate full marks.
- Assume suitable data , if necessary

CO1 (302041.1): Solve system of equations using direct and iterative numerical methods
CO2 (302041.2): Estimate solutions for differential equations using numerical techniques.

Unit 1

Q.1. A	**Draw** the flowchart of Bi-section Method.	7
Q.1. B	Using Newton-Raphson Method and taking initial guess as zero. **Find** $x^3 - 5x + 3 = 0$.	8
	OR	
Q.2. A	**Solve** by Bisection method $3x = \cos x + 1$ correct up to three decimal places.	7
Q.2. B	Using Gauss Seidel method, **solve** the following set of simultaneous equations up to 3 decimal places. $x + 2y + z = 0$; $3x + y - z = 0$; $x - y + 4z = 3$	8

Unit 2

Q.3. A	**Solve** the Laplace equation $\frac{\partial^3 U}{\partial y}, \frac{\partial^3 U}{\partial y} > 1$ for the square mesh as shown in figure 	7
Q.3. B	Use Euler's method with h = 0.5 to **solve** the initial value problem over the interval x = 0 to 2. $\frac{dy}{dx} = yx^2 - 1.1y$; where y(0) = 1	8
	OR	
Q.4. A	Use Runge Kutte method of fourth order to obtain the numerical solution of $\frac{dy}{dx} = \sqrt{(x^2 + y)}$. **Find** y at x = 0.4, given y(0) = 1, take h = 0.2.	7
Q.4. B	**Determine** the solution of $\frac{dy}{dx} = 3x + y^2$ using Taylor's series method. Given y(0) = 1. Determine y(0.1).	8

AISSMS
COLLEGE OF ENGINEERING

ज्ञानम् सकलजनहिताय

Accredited by NAAC with "A+" Grade

Department of Mechanical Engineering

Vision

"To be recognized as a premier center in the field of Mechanical Engineering

Academic Year : 2022-23 (Term I)

Test : I

Class :	**TE Mechanical Sandwich**	**Subject:**	**Numerical & Statistical Methods (302041)**
Date :	**Monday, May 02, 2022**	**Max Marks :**	**30**

Mark list

Roll No	Name of the Student	Marks
20MS001	AGRAWAL JAY GANESH	2
19MS031	ATUL BALU LOKHANDE	ABSENT
21MS301	BHOI BHAVESH SUNIL	4
20MS002	BHONSLE KARAN HAMBIR	0
20MS003	BHOSALE JAYESH DATTATRAY	3
20MS004	BUUNDELE PRERNAA DINESH	0
21MS302	CHAUDHARI DEVENDRA ANIL	7
21MS303	CHAUDHARI MOHAN DATTATRAY	17
21MS304	CHAUDHARI ROHIT PRAMOD	10
21MS305	CHAUDHARI SHALEM NARESH	1
20MS005	CHOUDHARI KAILASH SOMARAM	0
21MS306	CHOURE RAMHARI ASARAM	5
20MS006	DAKLIYA YASH PRASHANT	9
21MS307	DALE PRASHANT DILIPRAO	8
21MS308	DATE DHANANJAY VILAS	18
21MS309	DESHMUKH ATHANG VIVEK	14
21MS310	GAIKWAD TEJAS SHAILENDRA	ABSENT
21MS311	GARODI KUNAL NAMDEO	1
21MS312	GHODERAO SHUBHAM ANIL	0

21MS313	GORAD SAURAV GORAKSHANATH	3
21MS314	GUGALE YASH SANDIP	5
20MS007	GUJARATHI GAURANG PANKAJ	0
21MS315	HATTARGE ABHISHEK ANIL	12
20MS008	HATTEKAR NIKHIL ABHAY	11
21MS316	HINGANE SHUBHAM VIKAS	15
20MS009	INGALE ASAWARI DINKAR	12
20MS010	IRALE SUMEET SURESH	0
20MS011	JADHAV SHANTANU SANJAY	10
20MS012	JADHAV SHASHWAT SHIVAJI	2
20MS013	JAKAPURE SHIVSHANKAR SURESH	0
20MS014	KADAM KRISHNA BALASAHEB	0
21MS317	KADAM SIDDHANT SACHIN	0
21MS318	KALE MANSI ULHAS	3
21MS319	KARANJKAR ADITI RAMCHANDRA	2
20MS015	KHARKAR PUSHPANJAY HEMKANT	1
21MS320	KHATIB AFRID FIROJ	0
21MS321	KSHIRSAGAR SHARVARI MADHUKAR	7
20MS016	KULKARNI ABHISHEK PRASHANT	8
20MS017	LATE PRATHAMESH GIRISH	9
21MS322	LIMKAR SHAUNAK PRASHAANT	2
21MS323	LONARI ROHIT SHANKAR	9
21MS324	MAGARE OM SHIRISH	0
21MS325	MALEKAR SARVESH DEEPAK	ABSENT
20MS018	MANDALE ADITYA UMESH	ABSENT
21MS326	MANE MANASI NARENDRA	ABSENT
20MS019	MHASKE CHAITANYA MILIND	ABSENT
21MS327	MUJAWAR MAHAMMADSAIF JAKIRHUSEN	4
21MS328	PALANGE ATHARVA PRADEEP	7
21MS329	PALIWAL SHEETAL SACHIN	0
20MS020	PALVE VEDANT CHANDRAKANT	0
21MS330	PANCHAL MAROTI DNYANOBA	5
20MS021	PATEL YASH JAYANT	17
21MS331	PATIL ADITYA AJAY	15
21MS332	PATIL KANISHK SHARAD	2
20MS022	PATIL PARTH DINKARRAO	ABSENT

21MS333	PATIL PRAGATI UDAY	11
21MS334	PATIL RAJ KIRAN	0
20MS023	PATIL SIDDHESH MAHESH	0
20MS024	PATIL YASH DIPAK	ABSENT
21MS335	PAWASKAR MAYURESH KISHOR	6
20MS025	PIMPLE MALHAR AJIT	7
21MS336	POMAN PRACHIT PRAVIN	ABSENT
21MS337	RANE VISHAL PRAKASH	0
21MS338	SABALE PRAHLAD GAUTAM	19
21MS339	SHINDE SANDHYA DHARMRAJ	20
20MS026	SHINDE YOGADA SANTOSH	ABSENT
20MS027	SHIRODKAR ATHARWA SUHAS	2
21MS340	SONAWANE GANESH NIMBA	16
20MS028	SONAWANI PARTH SANJAY	ABSENT
21MS341	SONDKAR SHWETA AMOL	2
21MS342	SUTAR OMKAR BHARAT	2
21MS343	TAKLE ANUJ BALASAHEB	8
21MS344	TILEKAR CHETAN NANDKUMAR	8
20MS029	URKUDE NIRANJAN JITENDRA	4
20MS030	UTTEKAR ARYESH DHIRAJ	3
21MS345	WAGHMARE SHUBHAM SANDIP	2
20MS031	WELDE PARTH JAGDISH	1
20MS032	YEVATEKAR YASH MUKUND	2

Max Marks obtain :	**20**
Total Number of Student	**78**
Number of Students appeared	**67**
Number of student absent	**11**
Number of student passed	**9**
% of Passing	**13.4%**

Subject Teacher

Dept. Academic Coordinator

SVL

Head of Department

337 TEMS

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name Sandhya Dharmraj Shinde Roll No.: 21M5939

Subject Numerical + statistical Method Division : Mech Sand.

Examination Class Test - 01 Day & Date : Monday 22 Aug 2022

Question No.	1	2	3	4	5	6	7	8	9	10			Total Marks
Marks	8	-	8	-									20

+4

Examiner Signature

NSM: An

UNIT 01

1) B) Find $x^3 - 5x + 3 = 0$

$x = 0$ $n = 3$

Step I

$y' = 0^3 - 5 \times 0 + 3 = 3$

$y'' = 3x^2 - 5 = -5$ $F'(0) = -5$

$y''' = 6x = 0$ $F''(0) = 0$

$y' = \frac{F(x) \cdot F''(x)}{[F'(x)]^2}$

$= \frac{3 \times 0}{-5} = 0 < 1$

-8

$x_2 = x_1 - \frac{F(x)}{F'(x)} = 0.6$

Accuracy $|0.6 - 0|$

$= 0.6$

Iteration 2

$x_1 = 0.6$

$F(x) = 0.216$

$F'(x) = -3.92$

$x_2 = 0.6 - \frac{0.216}{-3.92} = 0.65510$

Iteration 3

$x_2 = x_1 = 0.65510$

$F(x) = 0.0060$

$F'(x) = -3.710$

$x_2 = 0.65565$

Q 3B Euler's Method:

$x = 0$ to 2 , $h = 0.5$

i.e $X = 0$ $X_g = 2$

$\frac{dy}{dx} = y x^2 - 1.1 y$

where $y(0) = 1$

Step I

$n = \frac{X_g - X_0}{h}$

$= \frac{2 - 0}{0.5}$

$n = 4$

Iteration 1 $X_0 = 0$

$y_0 = 1$ $y_1 = ?$ at $x = 0.5$

$F(x_0, y_0) = y_0 (x_0)^2 - 1.1 y$

$= 1 (0)^2 - 1.1 \times 1$

$F(x_0, y_0) = -1.1$

$y' = y_0 + h F(x_0, y_0)$

$= 1 + 0.5 \times (-1.1)$

$y' = 0.45$

Iteration 2 $X_0 = 0.5$

$y_2 = ?$ at $X_2 = 1$

$y_1 = 0.45$

$F(x_1, y_1) = y_1 x_0^2 - 1.1 y_1$

$= 0.45 \times (0.5)^2 - 1.1 \times 0.45$

$= -0.3825$

$y'' = y_1 + hf(x_1, y_1)$

$= 0.45 + 0.5 \times (-0.3825)$

$= 0.25875$

Iteration 3 $x_0 = 1$ $y_3 = ?$ at $x_3 = 1.5$

$y_2 = 0.25875$

$F(x_2 y_2) = y_2 (x_0)^2 - 1.1 y_2$

$= 0.25875 (1)^2 - 1.1 \times 0.25875$

$= -0.025875$

$y^{III} = y_2 + hF(x_2 y_2)$

$= 0.25875 + 0.5 \times (-0.025875)$

$= 0.245815$

Iteration 4 $x_0 = 1.5$ $y_4 = ?$ $x_4 = 2$

$y_3 = 0.245815$

$F(x_3 y_3) = y_3 (x_0)^2 - 1.1 y_3$

$= 0.245815 (1.5)^2 - 1.1 \times 0.245815$

$= 0.2826255$

$y^{IIII} = y_3 + hF(x_3 y_3)$

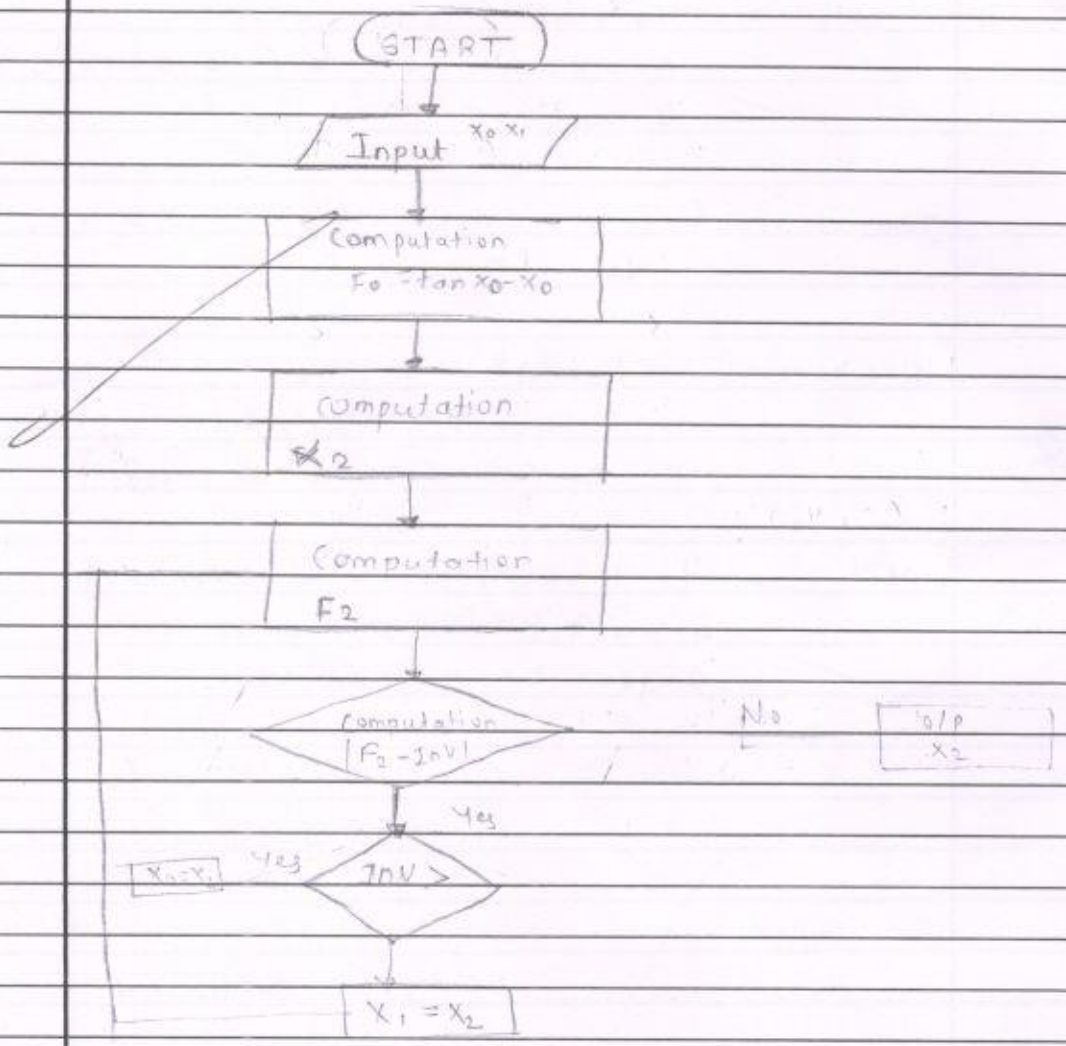
$= 0.245815 + 0.5 \times 0.2826255$

$= 0.387115$

DSM

Q 1 A Flow chart of Bi-section Method

Bi-section Method



AISSMS
COLLEGE OF ENGINEERING
(Accredited by NAAC with grade A+)

DEPARTMENT OF PRODUCTION ENGINEERING

Unit Test II Attendance Sheet

Class: TE Production (Sandwich) **Room No.:** 240
Subject : Kinematics & Design of Machine **Time.:** 10.30 to 11.30 am

SR. No	ROLL NO.	NAME OF THE STUDENTS	Signature
1	21PS301	BHAGAT KRUSHNA VIJAY	
2	21PS302	BHOSALE OMKAR MANOJ	
3	20PS001	BHOSALE SAHIL MANOJ	
4	17PS011	DAIVE PRANAV SUBHASH	AB
5	21PS303	DESHMUKH SATYAJEET GOPALKRUSHNA	
6	21PS304	DESHMUKH SHRIGANESH PRAVINCHANDRA	
7	21PS305	DHAKE PURVESH PRAVIN	
8	20PS002	DHOKARE SURAJ RAMDAS	
9	21PS306	GAIKWAD PRATIK TRUSHANT	
10	20PS003	GHAROTE SAISHNU SANJAY	
11	21PS307	GORE RAHUL RAJU	
12	20PS004	JADHAO SHIVRAJ HEMANT	AB
13	21PS308	KACHI ADITYA GIRISH	
14	21PS309	KALE PRANAV PRATAP	
15	21PS310	KARDILE GAURAV SANTOSH	
16	21PS311	KHAN MUHAMMED JAWWAD	
17	21PS312	MAHAJAN SHARDUL RAVINDRA	
18	20PS005	MANDHARE ATHARVA RAVINDRA	
19	20PS006	MOHD TOUSEEF	
20	21PS313	MORE NILESH SANJAY	
21	21PS314	NAIK RUTURAJ VIJAY	
22	21PS315	PARNERKAR ATHARVA UMESH	
23	20PS007	PATIL ADITYA KAILAS	
24	21PS316	RATHOR KUNAL SURESHCHAND	
25	21PS317	SONAWANE SANKET AJAY	
26	20PS008	TADAS YASH JAGDISH	
27	21PS318	TALEKAR PRATHMESH MOHAN	
28	21PS319	THAKUR EKTA SHANMUKH	
29			
30			

Signature of Examiner

Head of Department

Head of Department
Production Engineering
AISSMS COE, PUNE 1

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
(Accredited by NAAC with grade A+)

DEPARTMENT OF PRODUCTION ENGINEERING

UNIT TEST: II

Class: TE Production (Sandwich Pattern) **AY: 2022-23 Term: II**
Course: Kinematics and Design of Machines **Course Code: 311084(A)**
Time: 1:00 Hr **Max. Marks: 30**

CO 3:Students will be able to apply the fundamentals of kinematics for analysis of cams and flywheel.
CO 4:Students will be able to design the simple components shaft, beams subjected to fluctuating loading.

Q. No.		Question	Marks	Cognitive Level
Q1)	a)	Define the following terms as applied to cam with neat sketch: i) Base Circle ii) Pitch Circle iii) Pressure angle iv) Stroke of the follower	06	Understand
	b)	A punching press is required to punch 40 mm diameter holes in a plate of 15 mm thickness at the rate of 30 holes per minute. It requires 6 N-m of energy per mm2 of sheared area. If the punching takes 1/10 of a second and the r.p.m. of the flywheel varies from 160 to 140, determine the mass of the flywheel having radius of gyration of 1 metre.	09	Apply
		OR		
Q2)	a)	Sketch different types of cams and follower and name it.	06	Understand
	b)	A multi-cylinder engine is to run at a speed of 600 r.p.m. On drawing the turning moment diagram to a scale of 1 mm = 250 N-m and 1 mm = 3°, the areas above and below the mean torque line in mm2 are : + 160, – 172, + 168, – 191, + 197, – 162 The speed is to be kept within ± 1% of the mean speed of the engine. Calculate the necessary moment of inertia of the flywheel. Also determine the mass of flywheel rim. The density of the cast iron is 7250 kg/m3 and its hoop stress is 6 MPa. Assume that the rim contributes 92% of the flywheel effect.	09	Apply
Q3)	a)	Explain fluctuating stress, repeated stresses and reversed stresses. Draw diagram for each type of stress	06	Understand
	b)	A cantilever beam of circular cross-section, made of cold drawn steel having ultimate tensile strength of 550 N/mm^2, is fixed at one end and is subjected to completely reversed force of 15 KN at the free end. The force is perpendicular to the axis of the beam. The distance between the fixed and free end of the cantilever beam is 200 mm. The theoretical stress concentration factor and the notch sensitivity at the fixed end are 1.35 and 0.85 respectively. The surface finish factor is 0.80. The expected reliability is 90%, for which the reliability factor is 0.897. The values of size factor are as follows:		

Diameter 'd' in mm	Size Factor

Head of Department
Production Engineering
AISSMS COE, PUNE 1

$d \leq 7.5$	1.00
$7.5 < d \leq 50$	0.85
$d > 50$	0.75

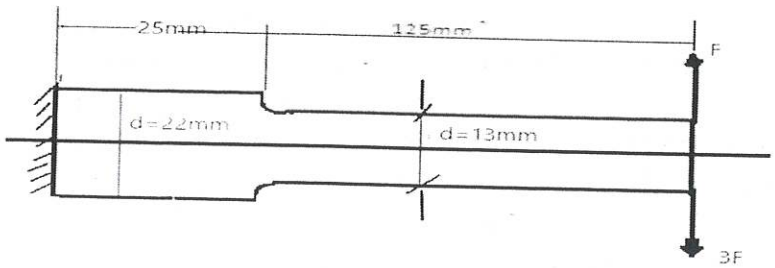
If the factor of safety is 2.0, determine the diameter of the beam for infinite life.

09 Apply

OR

Q4) a) What is Notch sensitivity? Why it is required? what are its extreme values for fully sensitive and no sensitive material to notch effects? 05 Understand

b) A cantilever beam made of cold drawn steel 35C8(S_{ut}= 550 N/mm^2 and S_{yt} = 320 N/mm^2), shown in Fig. is subjected to a load which varies from -F to 3F. The surface finish factor and size factor are 0.89 and 0.85, respectively. The theoretical stress concentration factor and notch sensitivity at the fillet are 1.42 and 0.9, respectively. If the factor of safety is 2, determine the maximum value of F, which the cantilever beam can withstand for infinite life.



10 Apply

Head of Department
Production Engineering
AISSMS COE, PUNE 1

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
(Accredited by NAAC with grade A+)

DEPARTMENT OF PRODUCTION ENGINEERING
Test II Marksheet

Class: TE Prod s/w
Subject : Kinematics & Design of Machine

SR. No	ROLL NO.	NAME OF THE STUDENTS	Marks	Remark
1	21PS301	BHAGAT KRUSHNA VIJAY	16	
2	21PS302	BHOSALE OMKAR MANOJ	20	
3	20PS001	BHOSALE SAHIL MANOJ	18	
4	17PS011	DAIVE PRANAV SUBHASH	AB	
5	21PS303	DESHMUKH SATYAJEET GOPALKRUSHNA	21	
6	21PS304	DESHMUKH SHRIGANESH PRAVINCHANDRA	21	
7	21PS305	DHAKE PURVESH PRAVIN	17	
8	20PS002	DHOKARE SURAJ RAMDAS	20	
9	21PS306	GAIKWAD PRATIK TRUSHANT	23	
10	20PS003	GHAROTE SAISHNU SANJAY	20	
11	21PS307	GORE RAHUL RAJU	20	
12	20PS004	JADHAO SHIVRAJ HEMANT	AB	
13	21PS308	KACHI ADITYA GIRISH	14	
14	21PS309	KALE PRANAV PRATAP	26	
15	21PS310	KARDILE GAURAV SANTOSH	18	
16	21PS311	KHAN MUHAMMED JAWWAD	16	
17	21PS312	MAHAJAN SHARDUL RAVINDRA	18	
18	20PS005	MANDHARE ATHARVA RAVINDRA	18	
19	20PS006	MOHD TOUSEEF	18	
20	21PS313	MORE NILESH SANJAY	18	
21	21PS314	NAIK RUTURAJ VIJAY	19	
22	21PS315	PARNERKAR ATHARVA UMESH	16	
23	20PS007	PATIL ADITYA KAILAS	20	
24	21PS316	RATHOR KUNAL SURESHCHAND	19	
25	21PS317	SONAWANE SANKET AJAY	21	
26	20PS008	TADAS YASH JAGDISH	14	
27	21PS318	TALEKAR PRATHMESH MOHAN	13	
28	21PS319	THAKUR EKTA SHANMUKH	22	

Vaibhav
Signature of Examiner

Head of Department

Head of Department
Production Engineering
AISSMS COE, PUNE 1

AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
(Accredited by NAAC with grade A+)

DEPARTMENT OF PRODUCTION ENGINEERING
Test- II
Result Analysis

Class: TE Prod s/w **AY: 2022-23**
Subject: Kinematics & Design of Machine **Term II**
Total No of Students As per Roll Call List: 28

Sr. No.	Description	Total No. of Students	Percentage (%)
1	Students Appear for Examination	26	92.86%
2	Students Absent for Examination	02	7.14%
3	Students Passed	26	100%
4	Students Failed	-Nil-	-Nil-

Veejhay

Sign of Faculty:
Name of Faculty: Veejhay Dholle
Date:

Mr S K Bidgar
Exam Coordinator

Dr N G Shekapure
HOD

Head of Department
Production Engineering
AISSMS COE, PUNE 1

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

SINCE 1917

Supervisor's Signature

Name Kale Pranav Pradap Roll No.: 21P5309

Subject Kinematics & Design of Machines Division :

Examination Unit Test - II Day & Date :

Question No.	1	2	3	4	5	6	7	8	9	10			Total Marks
Marks	13	-		13		-							26/30

Examiner Signature Verify

(Q1)

b) Solution:-

Given:- $d = 40mm$; $t = 15mm$; No. of holes = 30/min ;

Energy required $= 6 N\text{-}m/mm^2$; Time $= 1/10 s = 0.1 s$

$N_1 = 160$ r.p.m , $N_2 = 140$ r.p.m ; $k = 1m$

We know that sheared area per hole,

$= \pi . d . t = \pi \times 40 \times 15 = 1885 mm^2$

∴ Energy required to punch a hole,

$E_1 = 6 \times 1885 = 11310 N\text{-}m$

Energy required for punching work per second,

= Energy required per hole × No. of hdes per second

$= 11310 \times 30/60 = 1655 N\text{-}m/s.$

$E_2 = 5655 \times 1/10$

$= 565.5 N\text{-}m.$

∴ Energy to be supplied by the flywheel during punching a hole ie maximum fluctuation of energy of the flywheel

$\Delta E = E_1 - E_2$

$= 11310 - 565.5$

$= 10744.5$ N-m

Mean speed of the flywheel,

$N = \frac{N_1 + N_2}{2} = \frac{160 + 140}{2}$

$N = 150$ r.p.m

We know that, ΔE

$10744.5 = \frac{\pi^2}{900} \times m \cdot k^2 N (N_1 - N_2)$

$= 0.011 \times m \times 1^2 \times 150 (160 - 140)$

$= 33m$

$m = \frac{10744.5}{33}$

$m = 327$ kg

8

(Q4)

b)

→ Solution:-

Given:-

$S_{ut} = 550$ N/mm^2 $S_{yt} = 320$ N/mm^2

$P_{max} = 3F$ $P_{min} = -F$

$k_a = 0.89$ $k_b = 0.85$

$k_t = 1.42$ $q = 0.9$

$N_f = 2$

$S_e' = 0.5 S_{ut}$ or 700 N/mm^2] whichever is smaller

$= 0.5 \times 550$ OE $700\ N/mm^2$

$= 275$ OE 700.

$S'e = 275\ N/mm^2$

$k_f = q(k_t - 1) + 1 = 0.9(1.42 - 1) + 1$

$k_f = 1.378$

$k_e = 1/k_f = \frac{1}{1.378}$

$k_e = 0.7257$

$S_e = k_a \times k_b \cdot k_c \cdot k_d \cdot k_e \cdot k_g \cdot S'e$

$= 0.89 \times 0.85 \times 1 \times 1 \times 0.7257 \times 1 \times 275$

$S_e = 150.97\ N/mm^2$

OE

At fillet section,

$M_{max} = P_{max} \times l = 3F \times 125$

$= 375F\ N/mm$

$M_{min} = P_{min} \times l = -F \times 125$

$= -125F\ N-mm$

$(\sigma_b)_{max} = \frac{32 M_{max}}{\pi d^3} = \frac{32 \times 375F}{\pi (13)^3}$

$= 1.7386F\ N/mm^2$

$$(\sigma_b)_{min} = \frac{32M_{min}}{\pi d^3} = \frac{-32 \times 125F}{\pi (13)^2}$$

$$= -0.5795F \text{ N/mm}^2$$

$$\sigma_{bm} = \frac{(\sigma_b)_{max} + (\sigma_b)_{min}}{2}$$

$$= \frac{(1.7386F) + (-0.5795F)}{2}$$

$$= 0.5795F \text{ N/mm}^2$$

$$\sigma_{ba} = \frac{(\sigma_b)_{max} - (\sigma_b)_{min}}{2}$$

$$= \frac{(1.7386F) - (-0.5795F)}{2}$$

$$= 1.1591F \text{ N/mm}^2$$

Proof ?

Equation of line AB is,

$$\frac{S_m}{S_{yt}} + \frac{S_a}{S_{yt}} = 1 \quad \cdots (a)$$

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING

KENNEDY ROAD, PUNE - 411 001.

Supervisor's Signature

Name _____ Roll No.: _____

Subject _____ Division : _____

Examination _____ Day & Date : _____

Question No.	1	2	3	4	5	6	7	8	9	10			Total Marks
Marks													

Examiner Signature _____

Equation of line BC is,

$$\frac{S_m}{S_{ut}} + \frac{S_a}{S_e} = 1 \quad -- \quad (b)$$

Point B is the intersection of two lines.
Hence at point B,

$$\frac{S_m}{S_{yt}} + \frac{S_a}{S_{yt}} = \frac{S_m}{S_{ut}} + \frac{S_a}{S_e}$$

$$\frac{S_m}{320} + \frac{S_a}{320} = \frac{S_m}{550} + \frac{S_a}{150.97}$$

$$\frac{S_m}{765.217} = \frac{S_a}{285.81}$$

$$\frac{S_a}{S_m} = \frac{285.81}{765.217}$$

$$\frac{S_a}{S_m} = 0.3735$$

Now,

$$\tan\theta_L = \frac{Sa}{Sm}$$

OR

$$\tan\theta_L = 0.3735$$

$$\theta_L = 20.48^\circ$$

For the point under consideration,

$$\theta = \tan^{-1}\left[\frac{\sigma_{ba}}{\sigma_{bm}}\right]$$

$$= \tan^{-1}\left[\frac{1.1591F}{0.5795F}\right]$$

10

$$\theta = 63.43^\circ$$

OR,

As $\theta > \theta_L$, the equation of line BC governs the design.

$$\frac{Sm}{Sut} + \frac{Sa}{Se} = \frac{1}{N_f}$$

OR

$$\frac{\sigma_{bm}}{Sut} + \frac{\sigma_{ba}}{Se} = \frac{1}{N_f}$$

$$\frac{0.5795F}{550} + \frac{1.1591F}{150.97} = \frac{1}{2}$$

$$8.7313 \times 10^{-3} F = \frac{1}{2}$$

and $F = 57.26\ N$

$3F = 3 \times 57.26\ N$

$= 171.8\ N$

Q 1)

a)

→ i) Base circle :-

It is the smallest circle that can be drawn to the cam profile

ii) Pitch Circle :-

It is a circle drawn from the centre of the cam through the pitch point

iii) Pressure Angle :-

It is the angle between the direction of the follower motion and a normal to the pitch curve

iv) Stroke of the follower :-

It is the maximum travel of the follower from its lowest position to the topmost position.

(24)

a):

→ Notch sensitivity refers to the acceptability of a material to the initiation & propagation of cracks or fractures at the location of stress concentration, such as a sharp notch or a stress raiser

B Notch sensitivity is important to consider because it influences the fracture toughnes & fatigue strength of a material