



Sinhgad Institutes

SINHGAD TECHNICAL EDUCATION SOCIETY'S®

SMT. KASHIBAI NAVALE COLLEGE OF ENGINEERING®

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Affiliated to Savitribai Phule Pune University ID. No. PU/PN/ENGG/155/2001
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Recognized by UGC under Section 2 (f) & 12 (B) of UGC Act 1956

S. No. 44/1, Vadgaon (Budruk), Off. Sinhgad Road, Pune - 411041.

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PROF. M. N. NAVALE
M.E. (Elect.) MIE., MBA.
FOUNDER PRESIDENT

DR. (MRS.) SUNANDA M. NAVALE
B.A., M.P.M., Ph.D.
FOUNDER SECRETARY

DR. A. V. DESHPANDE
B.E., M. E.(Computer Engg.), Ph.D.
PRINCIPAL

To,
The Director,
National Assessment and Accreditation Council (NAAC)
P.O. Box No. 1075, Nagarbhavi,
Bengaluru - 560072

Subject: Proofs of metric No. 2.5.2

Reference: Metric No. 2.5.2: Mechanism to deal with internal examination related grievances is transparent, time-bound and efficient.

Dear Sir/Madam,

As per said subject kindly find below the index of file description/Documents for your valuable information.

Table with 3 columns: Sr.No., File Descriptions/Documents, Page No. It lists document details for five departments: Mechanical Engineering, Information Technology, Electronics and telecommunication, Management, and Engineering Sciences.

Handwritten signature of the Principal

Principal

Smt. Kashibai Navale College of Engineering, Pune

Principal
Smt. Kashibai Navale
College of Engineering
Vadgaon(Bk.), Pune - 41.

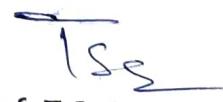
**Department of Mechanical Engineering**

**2.5.2**

**Record for Grievances**

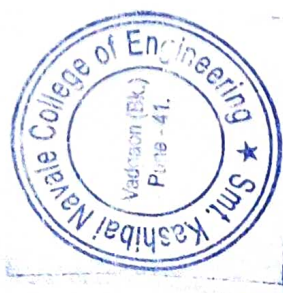
**Index**

<i>Sr. No.</i>	<i>Academic year</i>	<i>Content</i>
1.	2022-23	<ul style="list-style-type: none"><li>• <b>Marks Statement</b></li><li>• <b>Proof of action taken</b></li><li>• <b>Student action</b></li></ul>



**Prof. T.S. Sargar**

**HOD**  
Assistant Professor & Head  
Dept. of Mechanical Engg.  
Smt. Kashibai Navale College  
of Engineering, Pune - 41.



Sinhgad Technical Education Society's  
**Smt. Kashibai Navale college of Engineering, Pune - 41**  
Department of Mechanical Engineering

Date: 29/08/22

To,  
To Subject Teacher,  
Department of Mechanical Engineering,  
Sub: Regarding grievance in Unit Test/ Prelim Marks.

Respected Sir/Madam,

I, Samedh Milind Nikam Student of  
~~SE/TE/BE~~, Division III Roll No. M4353 Appeared UT-I/ UT-II/Prelim examination of subject AI in Robotics on 29/08/22 the marks secured by me in the said exam are 13  
I have grievance related to marks secured in the said examination.

This is my kind request to subject teacher to kindly address my grievance related to marks secured in the said subject examination.

Name and sign of Student

change 2 marks  
Remark of subject teacher: O.K.

Subject Teacher

  
Exam Coordinator  
Assistant Professor & Head  
Dept. of Mechanical Engg.  
Smt. Kashibai Navale College  
of Engineering, Pune - 41.



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S.No. 44/1, Vadgaon (BK), Off. Sinhgad road, Pune 411041

Department of Mechanical Engineering

RECOMMENDATION FOR CORRECTION IN MARKS

Date-

Academic year- 20 22-23

Examination: Unit Test I/ Unit Test II/ Prelim <sup>✓</sup>

Year: S.E./T.E./B.E.

Date of Examination: 24/08/22

Semester- I/II <sup>✓</sup>

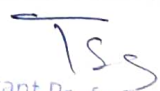
Name of Subject: AI in Robotics

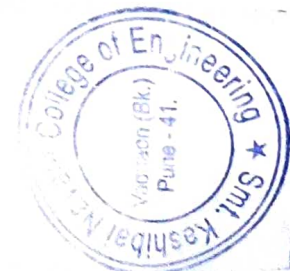
Name of Subject Teacher:

Sr. No.	Name of Student	Division	Roll No.	Marks before grievance submitted by student	Marks after addressing grievance	Recommendation Change/ No change
1	<u>Sumerdh Nikan</u>	<u>III</u>	<u>M4353</u>	<u>13</u>	<u>15</u>	<u>change</u>
2						
3						
4						
5						
6						

Sign  
Subject teacher

  
Sign  
Internal Exam Coordinator

  
Assistant Professor & Head  
Dept. of Mechanical Engg.  
Smt. Kashibai Navale College  
of Engineering, Pune - 41.



Sinhgad Technical Education Society's  
**Smt. Kashibai Navale college of Engineering, Pune - 41**  
Department of Mechanical Engineering

Date:

To,  
To Subject Teacher,  
Department of Mechanical Engineering,  
Sub: Regarding grievance in Unit Test/ Prelim Marks.

Respected Sir/Madam,

I, Sahil Santosh mane Student of  
SE/TE/BE, Division Two Roll No. 308 Appeared UT-I/ UT-  
II/Prelim examination of subject DTS on  
\_\_\_\_\_ the marks secured by me in the said exam are 20

I have grievance related to marks secured in the said examination.

This is my kind request to subject teacher to kindly address my grievance related to marks secured in the said subject examination.



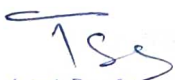
Name and sign of Student

Remark of subject teacher:

*change of two marks.*

Subject Teacher

  
Exam Coordinator

  
Assistant Professor & Head  
Dept. of Mechanical Engg.  
Smt. Kashibai Navale College  
of Engineering, Pune





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Department of Mechanical Engineering

RECOMMENDATION FOR CORRECTION IN MARKS

Date-

Academic year- 20

Examination: Unit Test I/ Unit Test II/ Prelim

Year: S.E. /T.E./B.E.

Date of Examination:


Semester- I/II

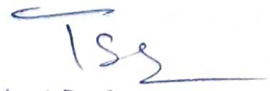
Name of Subject: DTS

Name of Subject Teacher: Y. C. Jadhav

Sr. No.	Name of Student	Division	Roll No.	Marks before grievance submitted by student	Marks after addressing grievance	Recommendation Change/ No change
1	Sahil mane	3	308	20	22	change.
2						
3						
4						
5						
6						

Sign  
Subject teacher

  
Sign  
Internal Exam Coordinator

  
Assistant Professor & Head  
Dept. of Mechanical Engg.  
Smt. Kashibai Navale College  
of Engineering, Pune - 41.



Name = Sumedh Milind Nikam  
Roll no = M4353 , Div = III  
Class = BE Mech  
Sub = AI in Robotics

BE

PAGE NO: 13  
DATE: \_\_\_\_\_

Robo 13

Q 1

A] Explain algorithms for uninformed search

The algorithms for uninformed search is the the type of the algorithm and the its is a very useful manner the algorithms of the uninformed search is not very unhapily and various mane for the numerous vehicles and the the uninformed factor of the redical create and the previous mane and the various performed substance and the very good provided and the many usefull and very usefull mane and the very domain and lets manufacture of the facility of the various types by the help of the algorithm and the algorithms are very usefull factor in the entire mane and it is lets very the supported factor of the mane.

B] The red coded genetic algorithm is the very useful mane and the very important aspect and usefull coded algorithm in the field of the AI in robotics the AI mane that artificial intelligence which is simulation of the human intelligence and thinking capability by the mane of the various factor of the continuous factors and the lets be conclude that intel by robotics

5 The red coded algorithms are used in the robots makes robot very usefull in the task performing factors



Assistant Professor & Head  
Dept. of Mechanical Engg.  
Smt. Kashibai Navate College  
of Engineering, Pune - 41.

c) hill climbing in heuristic search is the easiest experience in the field of the AI in robotics it makes robot more accurate in their task with increase the quality of work and value of the work the task and the welded rods and the various factors for the the robot make the performance very accurate and useful and the the performance of the various factor and it is the combination of the various factors. The factor of the various factor of the intelligence of the robot and the its intelligence of the factor and the various of its velocity and the work diagram of the factor safety.



Name - Sahil Santosh mane

Roll No - 308

sub: DTS

A) Hydrodynamic

20  
30

Hydrostatic

1) The relative motion between surface causes the lubricant to be drag into the bearing gap

1) The lubricant is pumped into bearing gap under pressure.

2) It cannot support higher load.

2) It can support higher load.

3) It is generally used at higher speed.

3) It is used at lower speed.

4) It can create high friction and heat.

4) It create less Friction and heat.

5) It do not required auxillary equipment like pump

5) It required auxillary equipment

6) It has simple construction

6) It has complex construction.

7) It required less maintance

7) It required high maintance.

Application engines, large centrifugal pumps, hydraulic turbines

Application rolling mills, high speed machine tools etc.

## c) Advantages of Hydrodynamic bearings

- 1) Friction Reduction:- The hydrodynamic film eliminates direct contact between the rotating shaft and the bearing, resulting in significantly reduced friction and wear.
- 2) High load capacity:- The fluid film supports the entire load, allowing hydrodynamic bearing to handle heavy loads without damage.
- 3) Self lubrication:- The relative motion between the shaft and the bearing generates the fluid film, eliminating the need for external lubrication system.
- 4) Cost-Effective Hydrodynamic bearing are relatively simple in design and can be manufactured at a lower cost compared to other types of bearings.

## Limitations of Hydrodynamic bearing:-

- 1) Startup Friction:- Hydrodynamic bearing require a minimum speed to establish the fluid film, making them less suitable for applications with frequent starts and stops.
- 2) Heat Generation:- The friction between the fluid film and the shaft can generate heat, dissipation in high-speed applications.

## Applications

- 1) Large Machinery.
- 2) Automobile industry
- 3) Power transmission:
- 4) Turbomachinery
- 5) Process industry

Q.3] A) The different types of brake brakes are:-

i) Disc Brake:-

- Application: Disc Brake Brakes are widely used in automobile vehicles such as cars, motorcycles.

ii) Drum Brakes:-

- Application: Drum brakes are commonly found in the rear wheels of automobiles and also used in some motorcycles.

iii) Hydraulic Brakes:-

- Application: Hydraulic Brakes are widely used in various vehicles, including cars, trucks, motorcycles and bicycles.

iv) Electromagnetic Brakes:-

- Application: Electromagnetic brakes are used in industrial machinery, elevators, ~~at~~ escalators, and robotics.

v) Band Brake:-

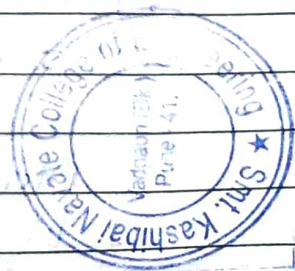
- Application: Band Brakes are commonly used in various application such as bicycles, motorcycles.

Advantages of Band Brakes:-

- 1) Simple design.
- 2) Cost-Effective.
- 3) Easy Installation.
- 4) Adequate Braking Power.

Disadvantages:-

- 1) Heat Dissipation



TSS

- 2) Fading at high speeds.
- 3) Adjustment Requirements
- 4) Limited Applications.

B) Components required are:-

- 1) Driving member
- 2) Driven member
- 3) Clutch Plate
- 4) Spring
- 5) Flyweights

Working :-

When the input shaft rotates, the Flyweights move outward due to centrifugal force. This action causes plates to compress together, establishing frictional contact between them. As a result, torque is transmitted from the driving member to the driven member, enabling power transfer. The engagement force is controlled by the spring tension, which keeps the clutch plates in contact during operation.

Advantages:-

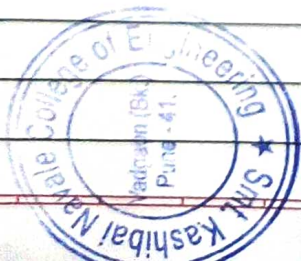
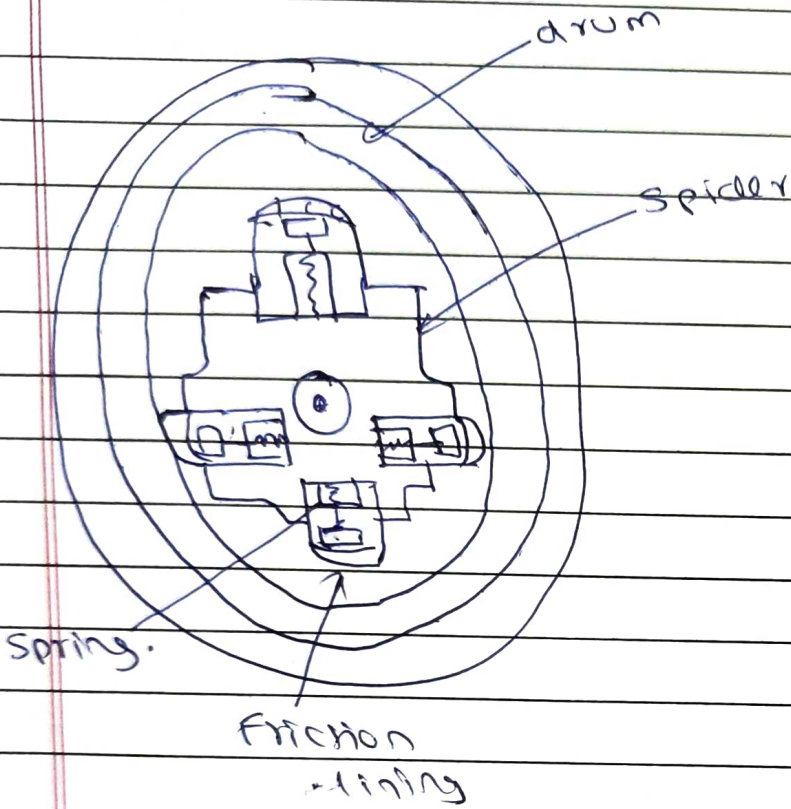
- 1) Automatic Engagement.
- 2) Smooth operation.
- 3) overload protection
- 4) simplified control

Disadvantages:-

- 1) Limited slip.
- 2) wear and maintenance

3) Heat Generation

4) Limited application



*T.S.*  
Assistant Professor & Head  
Dept. of Mechanical Engg.  
Smt. Kashibai Navale College  
of Engineering, Pune - 41.

**Department of Mechanical Engineering**


**Recommendation for correction of marks**

Academic year -2022-23

Year- B.E.

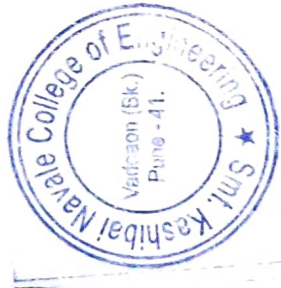
Examination: Unit Test I/Unit Test II/ Prelim

Sr. No.	Name of Student	Roll No.	Name of subject	Marks before grievance submitted by student	Marks after grievance	Recommendation Change/no Change
1	Sumedh M. Nikam	M4353	AI in Robotics	13	15	Change 2 Marks
2.	Sahil S. Mane	308	DTS	20	22	Change 2 Marks
3.	Atharva V. kalkho	277	IR & Automation	06	06	No Change
4.	Makarand V. Mhaskar	M3317	DTS	10	10	No Change

  
Prof. T.S. Sargar

HOD

Assistant Professor & Head  
Dept. of Mechanical Engg.  
Smt. Kashibai Navale College  
of Engineering, Pune - 41.





STES's  
Smt. Kashibai Navale College Engineering, Pune-41  
DEPARTMENT OF INFORMATION TECHNOLOGY

2.5.2  
Record of Grievances

Index

Sr. No	Academic Year	Content
1.	2022-23	<ul style="list-style-type: none"> <li>• Mark Statement</li> <li>• Proof of action taken</li> <li>• Student Action</li> </ul>



  
Prof. M. L. Bangare

HOD  
HOD

Department of Information Technology  
Smt. Kashibai Navale College of Engineering  
Vadgaon, (Bk.), Pune - 411 041

## 2.5.2

### Recommendation for correction in Mark

Date:

Academic Year- 2022-23


Examination: Unit Test

Year- S.E

Semester- I

Sr. No.	Name of student	Roll No.	Name of Subject	Mark before grievance Submitted by student	Mark after addressing grievance	Recommendation Change/No Change
1	Sanket R. Phadatare	23	DM	23	27	Change
2	Sakshi A. Kale	63	DM	25	27	Change



  
Prof. M. L. Bangare  
HOD

Department of information technology

HOD  
Department of Information Technology  
Smt. Kashibai Navale College of Engineering  
Vadgaon, (Bk.), Pune - 411 041



## 2.5.2

### Recommendation for correction in Mark

Date:

Academic Year- 2022-23


Examination: Unit Test

Year- S.E

Semester- I

Sr. No.	Name of student	Roll No.	Name of Subject	Mark before grievance Submitted by student	Mark after addressing grievance	Recommendation Change/No Change
1	Sanket R. Phadatare	23	DM	23	27	Change
2	Sakshi A. Kale	63	DM	25	27	Change



  
Prof. M. L. Bangare

HOD

Department of Information Technology  
Smt. Kashibai Navale College of Engineering  
Vadgaon, (Bk.), Pune - 411 041

Date:

To,  
The Subject Teacher,  
IT Dept. , SKNCOE  
Sub: Regarding grievance in Unit Test /Prelim Exam Marks

Respected Sir/ Mam,  
I Sanket Ramesh Phadtare Student of Second  
Year, division II. Roll no. 23 appeared UT-I / UT-II/ Prelim examination of  
Subject DM on 19/09/22

The mark secured by me in the said exam are 23 I have grievance related to  
marks secured in the said subject examination.

This is my kind request to subject teacher to kindly address my grievance related to  
marks secured in the said subject examination.

Name and Sign of the Student

( Sanket )

Sanket phadtare

Remark of Subject Teacher: marks change from 23 to 27  
Question NO (a-1(b)) marks increased by 4

  
Subject Teacher

Exam Co-ordinator.



Tsc  
Assistant Professor & Head  
Dept. of Mechanical Engg.  
Smt. Kashibai Navale College  
of Engineering, Pune - 41.

$\frac{23}{30}$  AB  
 $\frac{27}{30}$  AB

Ques: d  
19/9/22

Q1) a)  ~~$|A| = 80$  (C)~~  
 ~~$|B| = 50$  (COBOL)~~  
 ~~$|C| = 55$  (C)~~

Q1) a)  $A \cup B \cup C = 80$   
 $|A| = 50$  (COBOL)  
 $|B| = 55$  (C)  
 $|C| = 46$  (Pascal)  
 $|A \cap B| = 37$  (COBOL and C)  
 $|B \cap C| = 28$  (C and Pascal)  
 $|A \cap C| = 25$   
 $n(A \cap B \cap C) = 7$

i)  $A \cup B \cup C = 80 - 7 = 73$

$$|A \cup B \cup C| = |A| + |B| + |C| - |A \cap B| - |B \cap C| - |A \cap C| + |A \cap B \cap C|$$

$$73 = 50 + 55 + 46 - 37 - 28 - 25 + |A \cap B \cap C|$$

$$|A \cap B \cap C| = 12$$

12 students know all 3 languages.

ii)  $n(A \cap B \cap C) + n(A \cap B' \cap C) + n(A' \cap B \cap C)$   
 $= n(A \cap B) - n(A \cap B \cap C) + n(A \cap C) - n(A \cap B \cap C)$   
 $+ n(B \cap C) - n(A \cap B \cap C)$   
 $= 37 - 12 + 25 - 12 + 28 - 12$   
 $= 54$

54 students know exactly 2 languages.




Date:

To,  
The Subject Teacher,  
IT Dept. , SKNCOE  
Sub: Regarding grievance in Unit Test /Prelim Exam Marks

Respected Sir/ Mam,  
I ..... Sakshi Ankush Kale ..... Student of Second  
Year, division ...1.... Roll no. 12163.. appeared UT-I / UT-II/ Prelim examination of  
Subject .....DM..... on .....

The mark secured by me in the said exam are ...25.... I have grievance related to  
marks secured in the said subject examination.

This is my kind request to subject teacher to kindly address my grievance related to  
marks secured in the said subject examination.

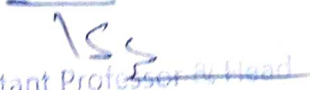
  
Name and Sign of the Student  
( Sakshi A. Kale )

Remark of Subject Teacher: mark change from 25 to 27  
Question No-3(b) marks increased by 2

  
Subject Teacher



Exam Co-ordinator.

  
Assistant Professor & Head  
Dept. of Mechanical Engg.  
Smt. Kashibai Navale College  
of Engineering, Pune - 41.

Name :- Kale Sakshi Ankush  
 Div :- 1  
 Roll no :- I2163

$\frac{25+2}{30}$

$\frac{27}{30}$

→ Q. 1 given :-  $U = 80$   
 let the A be the no of student who know cobol

B be the no of student who know c  
 and C be the no of student who know pascal

$n(A) = 50$  ,  $n(B) = 55$  ,  $n(C) = 46$   
 $n(A \cap B) = 37$   
 $n(B \cap C) = 28$   
 $n(A \cap C) = 25$   
 $n(A' \cap B' \cap C') = 7$

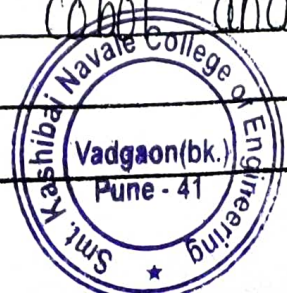
$n(A \cup B \cup C) = U - n(A' \cap B' \cap C')$   
 $n(A \cup B \cup C) = 80 - 7$   
 $n(A \cup B \cup C) = 73$

i)  $n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(A \cap C) + n(A \cap B \cap C)$   
 $73 = 50 + 55 + 46 - 37 - 28 - 25 + n(A \cap B \cap C)$   
 $n(A \cap B \cap C) = 73 - 61$   
 $n(A \cap B \cap C) = 12$

12 student know all three languages

ii) no of student who know cobol and c but not pascal  
 $= n(A \cap B) - n(A \cap B \cap C)$

Assistant Professor & Head  
 Dept. of Mechanical Engg.  
 Smt. Keshibai Navale College





Sinhgad Institutes

**E-4**

Sinhgad Technical Education Society's  
**Smt. Kashibai Navale College of Engineering, Pune – 41**  
Department of Electronics and Telecommunication Engineering  
**Criteria II**  
**Internal Examination Grievances**

**Index**

Sr. No.	Academic Year	Semester	Class (SE/TE/BE)	Subject	Examination (UT1/UT2/Prelim)
1	2022-2023	I	TE	DC	UT1
2	2022-2023	II	TE	CN	UT1



*Jagtap*

Dr. S. K. Jagtap  
HOD, E&TC  
Head

Dept. of Electronics &  
Telecommunication Engineering  
Smt. Kashibai Navale College

Date: 16/03/2023

To,  
The subject teacher,  
Department of E&TC Engineering,  
SKNCOE, Vadgaon, Pune.

Subject: Regarding grievance in UT1/ UT2/ Prelim exam Marks.

Respected Sir/ Madam,

I, Pratik Ramesh Barmeru, student of E&TC  
department, course SE/TE/BE division I/II/III/IV/V Roll Number E3505, appeared for  
UT1/UT2/Prelim Examination of Subject Cellular Network on  
8.1.23.

I have secured 24 Marks out of 30 in said examination. I have grievance related  
to marks in said subject examination.

This is my kind request to subject teacher/ Subject coordinator to kindly address my  
grievance related to marks secured in the examination.

Name and Sign of the Student

Pratik  
(Pratik Ramesh Barmeru)

Remark:

Paper is reassessed, marks are changed from 24 to 26.



Subject Teacher



Subject Coordinator

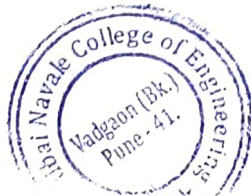


Exam Coordinator



Dr. S. K. Jagtap  
HOD (E&TC)  
Head

Dept. of Electronics &  
Telecommunication Engineering  
Smt. Kashibai Navale College  
of Engineering, Pune - 411 041



\*UNIT TEST - 01\*

24

01

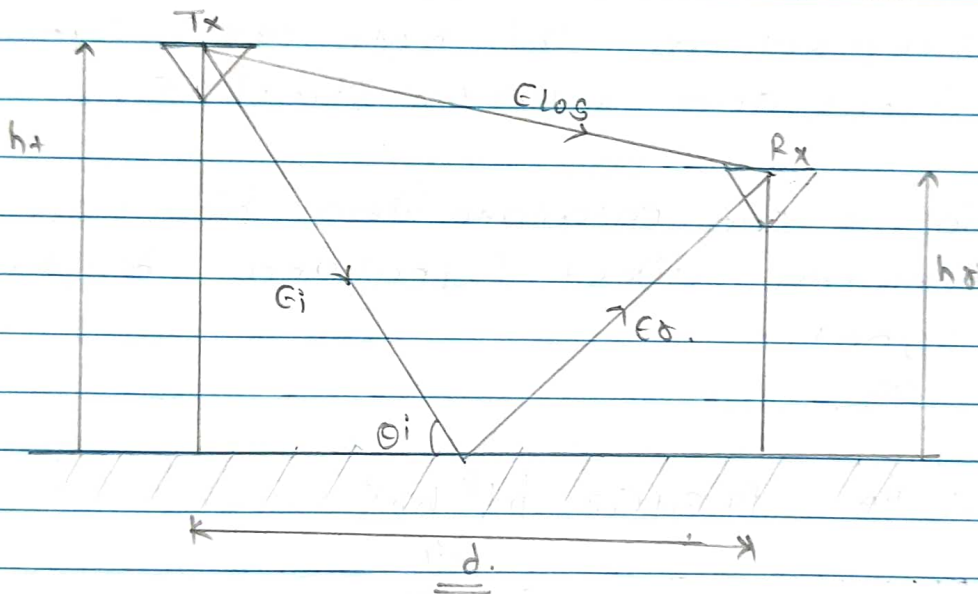
- Name: Pratik Ramesh Banerjee
- Class: DIV-V
- Subject: Cellular Network
- Date: 08-Mar-2023
- Roll No: E3505

change (26) V.P. Niwane

Previous marks	Changed marks
24	26

Q.1) a).

Soln: Ground Reflection (Two-Ray) model of wireless communication:



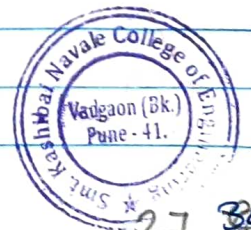
To find the path loss ~~exit~~ between the transmitted signal to receiver signal or predict the path loss of the signal in communication.

The given path is in two way first one is direct path Tx to Rx with  $E_{LoG}$  and second one is ground reflected path to Tx to Rx is  $E_i, E_r$ .

~~Jagtap~~

Head

Dept. of Electronics &  
Telecommunication Engineering  
Smt. Kashibai Navale College  
of Engineering, Pune - 411 041



27



Transmitting Signal height denoted by  $h_t$   
where as Received Signal height is denoted  
by  $h_r$ .

In this pathloss or communication both  
height are different similarly Transmitting  
Signal is more longer than received  
Signal.

In addition to this the LOS (Line of Signal)  
is add between this both the Signal transmitted  
Signal and reflected Signal, etc.

So we can calculate the hidden or pathloss  
between direct Signal and ground reflected  
Signal.  
as,

$$\therefore P_r = P_t G_t G_r \frac{h_t^2 h_r^2}{d^4}$$

5 Therefore the distance between in transmitted  
Signal and Received Signal ( $d \ll \sqrt{h_t h_r}$ ),  
as longer than the time required to  
transmitted the Signal.

0 So distance raised to 4<sup>th</sup> power at rate  
40 dB/decads.

Q.1.

b]

Soln: Channel Estimation technique in wireless system.

∴ Channel estimation is a challenging problem in wireless communication.

- Channel estimation includes delay, scattering of the signal in communication.
- Estimation of signal is having some noise in the signal which can be from the disturbance in the signal of communication channel.
- Estimation has channel taps.
- Channel Estimation Technique:
  - attenuate
  - phase shift
  - add noise
- Channel estimation attenuates the signal and adds the noise which is in signal communication.
- Channel estimation has many types and many techniques to estimate a good communication signal.



*Jagtap*  
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Dept. of Electronics &  
Telecommunication Engineering  
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So,

The Channel Estimation Technique in wireless Systems, estimated technique, are or:

- training based
- blind channel estimation
- semi-blind channel estimation

• The channel estimation has mainly controlled or regulated with proper Channel Matrix.

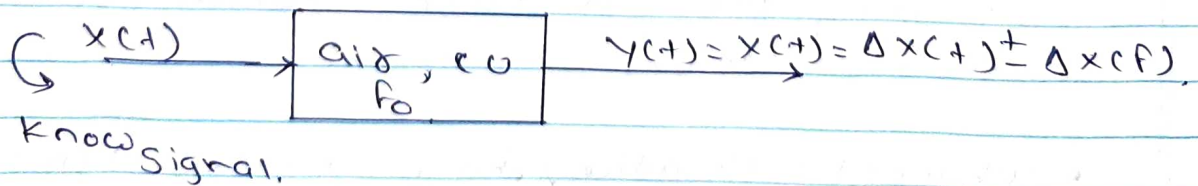
• So channel matrix is also as:

- 1) Behaves?
- 2) chs?
- 3) properties?

~~This are the parameters of the channel matrix.~~

This are parameters of the channel matrix.

• with Dia:



$$= \frac{8 \mu s}{1/B} = 8 \mu s \times 4 \times 10^6$$

$$= 32$$

loss in spectral efficiency  

$$= \frac{32}{288}$$

$$= \frac{8 \mu s}{72 \mu s} = 11.1\%$$

∴ loss in spectral efficiency arising when adding cyclic prefix.

Q.4.

Q.6) Multiple Input Multiple Output Orthogonal Frequency Division Multiplexing  
 → MIMO-OFDM transmitter:

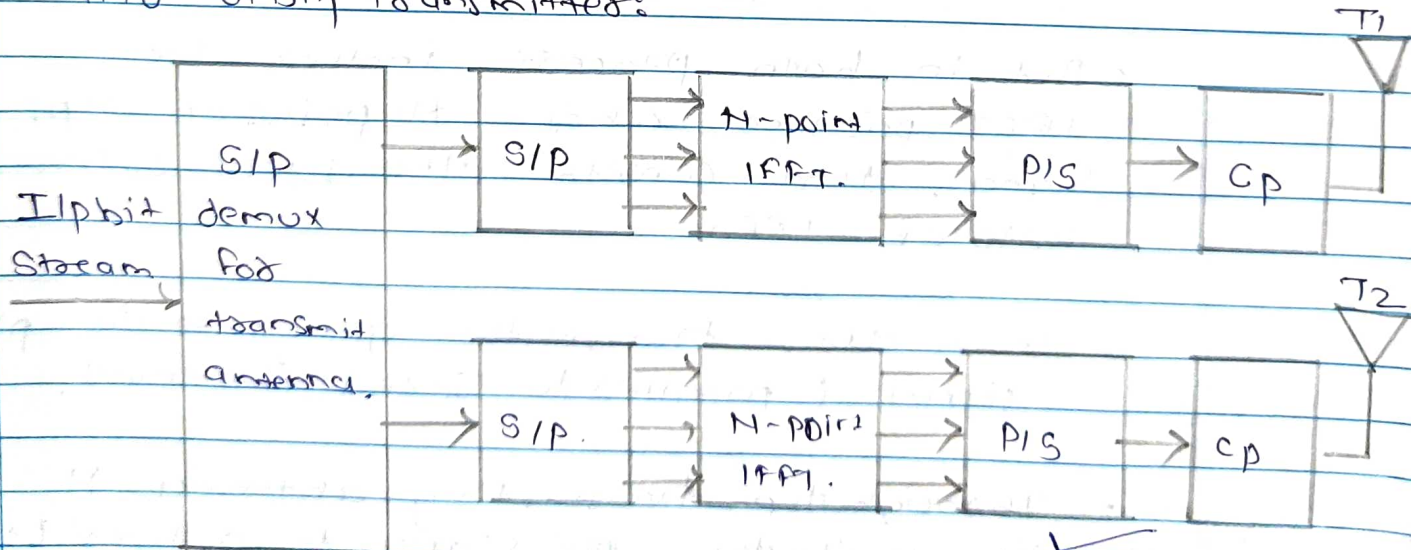


Fig: MIMO-OFDM transmitter



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 Dept of Electronics &  
 Telecommunication Engineering  
 Smt. Keshi Bai

• In MIMO transmitter the signal is input with the bit stream to the transmitter.

• MIMO has multiple transmitters but all the transmitters as same principal flow of transmitting the IP signal to forwarded to outward to receiver signal.

• MIMO transmitter firstly has serial signal to parallel signal. In the input stream

• demux antenna, to the  $S_p$  signals.

• transmitter has mainly converted the signals to opposite flow means a  $S_p$  to  $P_s$ .

• But in both process include the IFFT point or  $G$  or  $H$  point of  $S_p$  signal, that convert the signal with help of IFFT.

• Then after transmitter generate the  $P_s$  signal (parallel to serial sequence).

• Through the transmitting antenna it transmits the  $P_s$  signal to outward tower surrounding receiver signal of MIMO.

029 We know that the channel estimation is flow ~~of~~ with know signal through various kind of communication system, is with respect to the gain, Cu, fo etc. where the channel or signal get add or some interrupt in it. noise, phase shift or channel gain passed the signal to outward of the communication signal channel.

04 Simply we get an the estimated signal with different attenuation. Hence we can also denote or called known signal to ~~as~~ <sup>Output signal</sup> ~~as~~ <sup>below</sup> or Receiver  $\Rightarrow Y(t) = \sqrt{x}$ .

Q. 1.  
c)  
→ Given 30 SNR.

"convert it into dB"

$$F_{dB} = 10 \log F.$$

$$30 = 10 \log F.$$

$$\text{or } F = 1000.$$

$$k = 1.38 \times 10^{-23}$$

$$\therefore B = 10^3$$

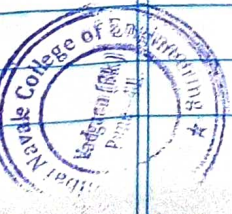
Noise power at input.

$$P_{ni} = FKT B.$$

$$= 1000 \times 1.38 \times 10^{-23} \times (273+27) \times 10 \times 10^3$$

$$= 4.14 \times 10^{-14} \text{ watt.}$$

04  $\therefore$  Signal power required  $4.14 \times 10^{-14}$  watt. at the input of receiver to achieve ~~SNR 30dB~~ SNR 30dB.



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Q.4.a)



Given,

∴  $W_{\text{imax}}$  = Worldwide interoperability  
microwave access.

$$N = 256,$$

$$B = 15.625 \text{ KHz},$$

$$CP = 12.5\%$$

$$B/N = 15.625 \text{ KHz}$$

$$\begin{aligned} \text{a) } B &= N \times 15.625 \\ &= 256 \times 15.625 \\ &= 4000 \\ &= \underline{\underline{4 \text{ MHz}}} \end{aligned}$$

$$\text{b) } \frac{N}{B} = \frac{256}{4 \times 10^6} = \underline{\underline{64 \mu\text{s}}}$$

Duration of Cyclic Prefix = 12.5% symbol time

$$= \frac{12.5}{100} \times 64 \mu\text{s}$$

$$= 8 \mu\text{s}$$

Sample time in CP =  $\frac{\text{CP duration}}{\text{Sample rate}}$

~~OK~~  
~~50V~~

Q.4.  
c)

Bit Error Rate (BER) of OFDM.

$$\therefore \text{BER} = \frac{1}{2} \left( 1 - \sqrt{\frac{L/M \text{ SNR}}{24L/M \text{ SNR}}} \right)$$

$L$ : no of channel tap.

$M$ : no of subcarriers.

SNR: (ratio in dB)

$$\text{SNR} = 10 \text{SNR}_{\text{dB}} / 10$$

03

It is necessary derivation of BER in OFDM.

03

well.

*Agar*  
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38



Sinhgad Technical Education Society's  
SMT. KASHIBAI NAVALE COLLEGE OF ENGINEERING, PUNE-41  
Department of Electronics and Telecommunication Engineering

Date: 30/08/2022

To,  
The subject teacher,  
Department of E&TC Engineering,  
SKNCOE, Vadgaon, Pune.

**Subject: Regarding grievance in UT1/ UT2/ Prelim exam Marks.**

Respected Sir/ Madam,

I, Rubhi Deepak Jangam....., student of E&TC department, course ~~SE/TE/BE~~ division ~~IV/II/V/V~~ Roll Number.. E3201..., appeared for UT1/~~UT2~~/~~Prelim~~ Examination of Subject... Digital Communication on 22/08/2022

I have secured 12...Marks out of 30..in said examination. I have grievance related to marks in said subject examination.

This is my kind request to subject teacher/ Subject coordinator to kindly address my grievance related to marks secured in the examination.

  
Name and Sign of the Student


(Rubhi Jangam...)

Remark: Paper is reassessed. There is no change in marks

  
Subject Teacher

  
Subject Coordinator

  
Exam Coordinator

  
Dr. S. K. Jagtap  
HOD (E&TC)

**Head**  
Dept. of Electronics &  
Telecommunication Engineering  
Smt. Kashibai Navale College  
of Engineering, Pune - 411 041



- Name :- Rushil Deepak Jangam
- Roll No :- E3201
- Subject :- Digital Communication

(12)

Sankar  
22/8/22

Previous Marks

12

Remark

No change

(12)

Q.2

a) if  $x(t) = A \cos(2\pi ft + \phi)$  is a random process with  $\phi$  is a random variable uniformly distributed over  $(0, 2\pi)$ . Prove that  $x(t)$  is ergodic in mean.

Ans:- Here,

$$x(t) = A \cos(2\pi ft + \phi)$$

$$\phi = (0, 2\pi)$$

So, to prove  $x(t)$  is ergodic in mean

$$= \frac{1}{2\pi} \quad 0 < x(t) < 2x$$

$$= 0 \quad \text{else}$$

$$\therefore \mu_x(t) = \int_0^{2\pi} A \cos(2\pi ft + \phi)$$

$$= A \int_0^{2\pi} \cos(2\pi ft + \phi)$$

$$= A \left[ \sin(2\pi ft + \phi) \right]_0^{2\pi}$$

$$= A \left[ \sin(2\pi ft + \phi) \right]_0^{2\pi}$$

$$= 0$$

~~Jagtap~~ = 0

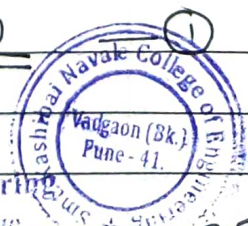
Head

Dept. of Electronics &

Telecommunication Engineering

Smt. Kashibai Navale College

Pune - 41



33/40

So, now we have to find  $\mu_x(T)$ ,

$$\therefore \mu_x(T) = \lim_{T \rightarrow 0} \int_{-T/2}^{T/2} A \cos(2\pi ft + \phi) \cdot \frac{1}{2\pi}$$

$$= \lim_{T \rightarrow 0} \frac{A}{2\pi} \int_{-T/2}^{T/2} A \cos(2\pi ft + \phi)$$

$$= \lim_{T \rightarrow 0} \frac{A}{2\pi} \left[ \frac{\sin(2\pi ft + \phi)}{2\pi f t} \right]_{-T/2}^{T/2}$$

$$= \frac{A}{2\pi} \left[ \sin 2\pi f \left[ \frac{T}{2} \right] + \phi \right] + \left[ \sin 2\pi f \left[ -\frac{T}{2} \right] + \phi \right]$$

= Here,

$$\frac{1}{T} = f_c$$

$$\therefore f \cdot T = 1$$

$$= \frac{A}{2\pi} [\sin 2\pi - \sin 2\pi]$$

$$= \underline{0} \quad \text{--- (2)}$$

So, From (1) & (2)

we can say that  $x(t)$  is ergodic in mean.

Q.2

c] Narrow band noise and represent narrowband noise in terms of inphase & quadrature Components

Ans: (1) Suppose  $n(t)$  be a narrow band noise having bandwidth  $2B$ .

(2) let,  $n_+(t)$  is the  $\quad \quad \quad$  and  $\tilde{n}(t)$  is the Complex Component.

(3)

$$n_+(t) = n(t) + \hat{n}(t)$$

(4) and,

$$\tilde{n}(t) = n_+(t) + e^{-j2\pi f_c t}$$

(5) Here,

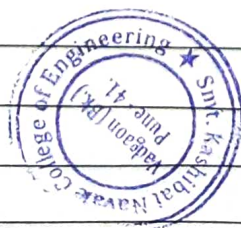
$n_I(t)$  is inphase Components

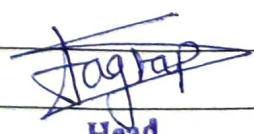
$n_Q(t)$  is Quadrature Components

$$\begin{aligned} \therefore n_I(t) &= n(t) \cos(2\pi f_c t + \phi) + \hat{n}(t) \sin(2\pi f_c t + \phi) \\ n_Q(t) &= \hat{n}(t) \cos(2\pi f_c t + \phi) - n(t) \sin(2\pi f_c t + \phi) \end{aligned}$$

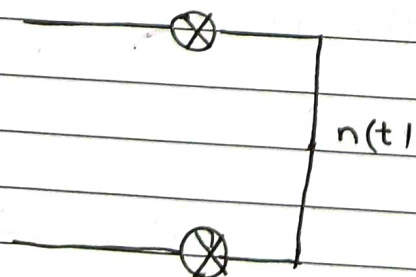
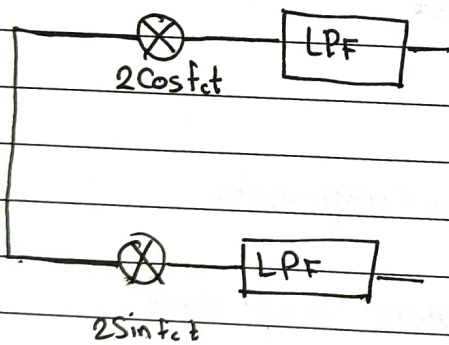
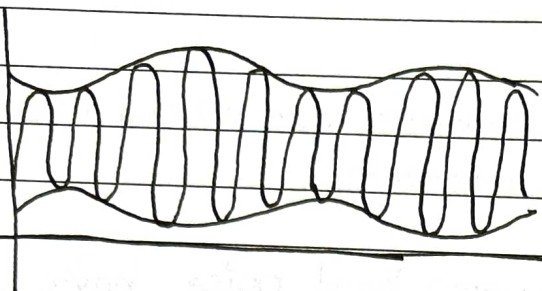
$$\therefore \text{Here, } n(t) = n_I(t) + j n_Q(t)$$

$$\therefore n(t) = n_I(t) \cos(2\pi f_c t + \phi) + n_Q(t) \sin(2\pi f_c t + \phi)$$



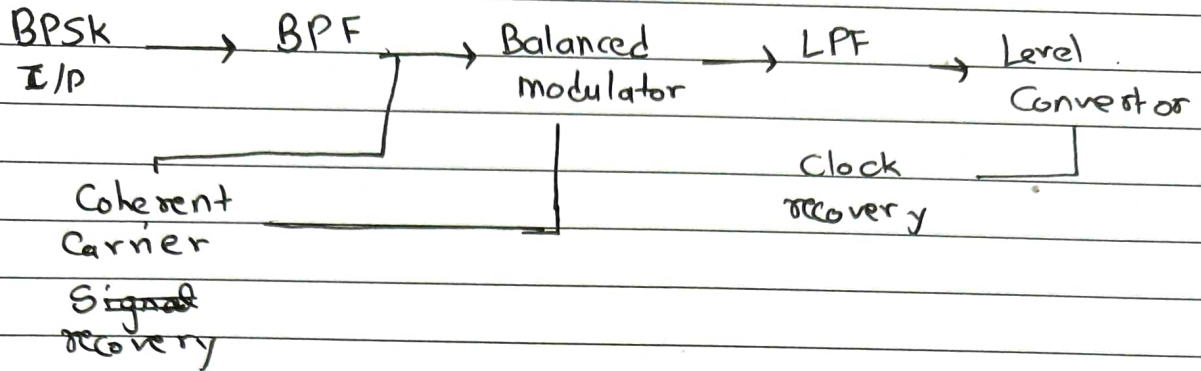
  
Head  
Dept. of Electronics &  
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of Engineering, Pune - 411 004

34#



Q.3

C



The Coherent Carrier recover ckt detects and regenerate carrier signal  $\sin \omega_c t$ . the this regenerated carrier has some freq. phase as carrier  $\theta$  carried at transmitter.

So the regenerated carrier is ensured ~~Car~~ Coherent carrier which is pro phase & freq. Synchronized at transmitter.

the filtered BPSK signal along with the regenerated carrier is applied to balance modulator which  $\cup$  as product detects.

$$\begin{aligned} B.m &= \text{BPSK regenerated Carrier} \\ &= C + (\sin \omega_c t \times \sin \omega_c t) \\ &= \pm \sin^2 \omega_c t \end{aligned}$$

$$B.m \sin^2 \theta = \frac{1}{2} - \frac{1}{2} \cos 2\theta$$

$$\therefore B.m. \text{ Output} = \frac{\pm 1}{2} \mp \frac{1}{2} \cos^2 \omega_c t$$

$\hookrightarrow$  DC ter                       $\hookrightarrow$  Second harmonic



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Department of Management

10-7-23

To,

Subject Teacher,

Sub: Regarding change in internal exam Marks

Respected Sir/madam,

I, Miss Vaishnavi Kamtham Student of Second Year, Roll No En16 appeared for internal examination of Subject PFP on 28-6-23

The marks secured by me in the said exam are 36. I have grievance related to marks secured in the said subject examination.

This is my kind request to subject teacher to kindly address my grievance related to marks secured in the said subject examination.

Name and Sign of the student  
(Vaishnavi Kamtham)

Remark of Subject Teacher: NO change

Subject Teacher



Head of Department

HEAD  
Dept. of Management Studies  
Smt. Kashibai Navale College of Engg  
Vadgaon (BK), Pune - 411 041.

RECOMMENDATION OF CORRECTION OF MARKS

Date: 10-7-23

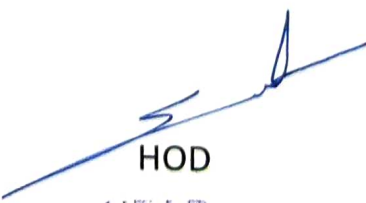
Academic year: 2022-23 Examination: Internal Exam

Year: 2023 Semester: III

Sr. No.	Name of Students	Roll no. /Division	Name of Subject	Marks before grievance submitted by student	Marks after addressing grievance	Recommendation Change/no change
1	Vaishnavi Kamtham	Fin 16	PFP	36	36	No change
2						
3						
4						

  
Subject Teacher



  
HOD  
HEAD

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Vadgaon (Bk.), Pune - 411 041.



36  
50

Topic :

~~86/50~~

No change

~~Ambar~~

Page No. : \_\_\_\_\_

Date. : / /

NAME :- Vaishnavi Krushnahari Kamtham

ROLL NO :- FIN 16

CLASS :- MBA 1st yr (2nd sem)

## Personal Financial Planning

Q.1

1) Define Investment.

→

Investment means the to invest our money in some kind of stock, bond, etc. for the future secure.

It is now days the very common financial method.

To our own money for gain the profit or future secure plan that own money invest in the market is known as the investment.

3) Types of Insurances plans.

→

There are various Types of investment

1) Life Insurance.

2) General Insurance

3) Vehicles Insurance

4) Health Insurance.



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For Educational Use Only

Topic : \_\_\_\_\_

- i) In Life Insurance this policy use for a after a person death if he claim that insurance that time he's family get that policy.
- ii) In General Insurance policy include like vehicle insurance now-days it is a compulsory for vehicle insurance.
- iii) Health Insurance is for the when a person is not healthy that time this policy is use only in some kind of hospitals.

#### 4) Term Risk.

→

- i) Term Risk it is help to let know that which policy or fund is risk ful for our. It help to find out that risk investment is good or not.
- ① ii) There are two types systematic risk and unsystematic risk in the investment.

6) Estate Planning ?

- i) Estate Planning is the how to operate the estate according your own idea is know as estate planning.
- ii) In that estate planning how to plan for financial, marketing, investment, company grow all planning are include in the estate planning.
- iii) It basically like the company operating system.

2) Crypto Currency ?

- i) Crypto Currency it is the like a investment which is digital investment.
- ii) It is virtual or a digital currency.
- iii) like a bit coins.
- iv) It is a invest in the digital platform and data all store in the cloud.
- v) It is very safe to invest in the digital platform.



Topic : \_\_\_\_\_

Q.2

1)  
→

FV = ? (future value)

PV = Present value = 11,300 ₹

n = 3.7 yr time period

r = 2.5% (Interest rate)

= 0.025

$$FV = PV (1 + r)^n$$

$$= 11,300 (1 + 0.025)^{3.7}$$

$$= 11,300 (1 + 0.025)^{30}$$

$$= 11,300 (1.025)^{30}$$

$$= 11,300 \times 2.0975$$

$$= 23701.75$$

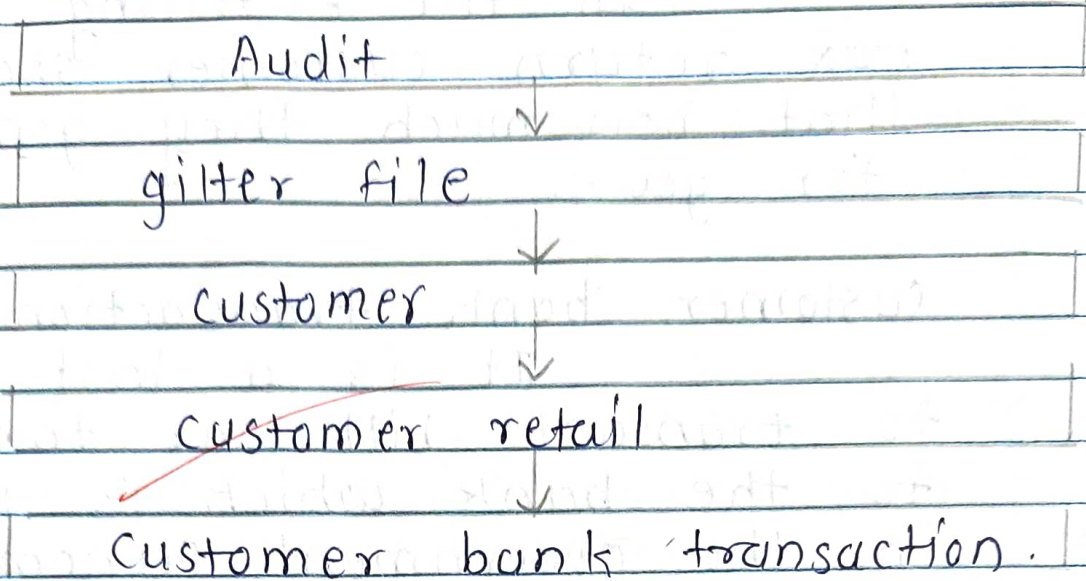
$$\underline{FV = 23701.75}$$

future value after 3.7 yr

$$= \underline{23701.75 ₹}$$

Topic : \_\_\_\_\_

3) E - filling of income tax return.  
 → Procedure.



This all procedure include in the E-filling of income tax return.

1) Audit :-

In audit they show know that how much company financial income as per they proceed the next step it very tough to the Audit to do process.

2) gilter file :-

In that all information include about the customer, company, etc. how much the gone a pay for income tax.



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Topic : \_\_\_\_\_

customer :-

In the E-filing of income tax return customer should know that how much they gone a pay for gov.

customer bank transaction :-

It is a last procedure to transact bill our tax payment to the bank which is include in the government Economy.

5

∴ This are all procedure of E-filing in income tax returns.

3) ~~E-filling of income tax return.~~

E-filling :-

It is a basically digital process where we know that how much tax is return it's all in online form.

E-filling income tax return.

- i) It is amount of money gave to the government for their tax.
- ii) In bank every one should pay for the tax it is rule for the citizen.
- iii) tax return is different value as per the person income. in that E-filling they show how much tax pay.
- iv) ~~In bank online form like mobile~~ Procedure of income tax return. Their are several procedure are include in E-filling of income tax return.



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Topic : \_\_\_\_\_

Q. 3

1) taxation impact on different investment options.

→

taxation impact is a part of a day to life. But in the impact on different investment.

i) Mutual fund Investment :-

When we invest in the mutual fund that time in that investment their risk or return is also available. and tax is also impact on that investment.

When we invest in some stock or bond that time we sell that stock and withdraw that money in market that time government put tax on that investment.

ii) General Investment :-

(a) open-ended =

In that open-ended the tax impact on when we sell that stock. It open-ended basically like sell & invest.

(b) close-ended = In this investment only invest in the starting phase



They didn't invest in any time and that stock, bond sell after the term end and that time tax impact on the investment. Some time we have to give so much tax.

(c) interval investment =

only interval period we can sell the invested money that time we have to pay tax otherwise in middle we can sell it. in the interval investment taxation impact on the middle time when we sell the stocks.

Board Investment :-

(a) Equity Mutual fund investment =

Mainly invest in stock market that time in investment financial manager invest in good company. when we withdraw that stock from company or invest in company in that profit our tax is pay by government.

(b) Debt investment =

Is like invest in the government bond treasury bill, that time it's not like that we invest in gov. bond so we don't pay for



Topic : \_\_\_\_\_

tax and taxation is impact on also Debt investment.

The Debt investment this is a less risk / return than the equity investment.

(c) hybrid investment :-

Invest in the equity debt. when we invest in debt taxation impact on the investment ~~is~~ hybrid investment is risk / return less than Equity investment or greater than ~~is~~ debt investment.

so tax is equally impact on the hybrid investment.

∴ This all are the different options ~~impa~~ taxation impact on investment paying tax is compulsory for the every citizen.

Q.5

- 1) Retirement Planning ; Explain various means available for retirement planning?

Retirement Planning :-

After a certain time period or a age when a people are quit or leave their job by their own good is known as retirement.

Retirement Planning :-

Planning is basically our future idea that according we are doing our things. So retirement planning is future idea after we quite our job or leave that time we implement that planning for our own goods.

Various Means available (after) for retirement planning.

- 1) when people do job that time at a certain time period they have to retire also from the work that time after retirement some company gave the employee policy for them



Topic : \_\_\_\_\_

retirement policy; Health insurance, Life insurance policy, Pension, Home allowance this kind of various means available for retirement planning.

A) Health insurance :-  
before we retire we should have to claim for the Health insurance it is very useful for our daily life. if we very ill & we can't afford Hospital bills that time Health insurance use after retire.

B) Life Insurance Policy :-  
Life Insurance policy is also use in retirement planning because if something happen you when retire that time LIC is use ful for their family. this policy money help for their financial problem.

C) Pension :-  
Pension is now daily comm in government sector. if we retire that time government give that person to the pension for every

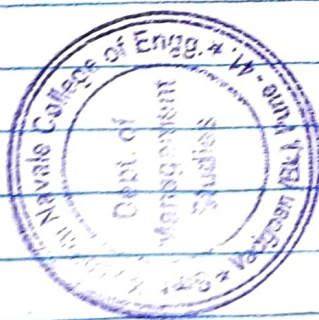
Month that pension means allowances which government give us for our future secure.

D) Home allowance :-

In some company when a employee retire that time they gave also home allowance but it's depend on company.

∴ This are various means available for retirement planning which government or company gave us for our future secure.

9



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## Sinhgad Institutes

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Department of Engineering Sciences

## 2.5.2 Record of Grievances

### Index

S.N.	Academic Year	Content
1	2022 – 23	<ul style="list-style-type: none"> <li>• Mark Statement</li> <li>• Proof of action taken</li> <li>• Student Application</li> </ul>



Prof. M.S. Alandkar  
HOD  
(Department of Engineering Sciences)

Head of Department  
Engineering Science Department  
Smt. Kashibai Navale College  
of Engineering, Vadgaon, Pune - 41.

**RECOMMENDATION FOR CORRECTION IN MARKS**

Date-21/07/2023

Academic year- 2022-23

Examination: Unit Test I / Prelim


Year: F.E.

Semester- I & II

Sr. No.	Name of Student	Roll No. /Division	Name of Subject	Marks before grievance submitted by student	Marks after addressing grievance	Recommendation Change/ No change
1	Ashish S. Kenjale	14	EM	19	22	Change
2	Gaurav N. Sonawane	8	BEE	30	30	No Change

  
Internal Exam Coordinator



  
Prof. M. S. Alandkar  
HOD

(Department of Engineering Sciences)

Head of Department  
Engineering Science Department  
Smt. Kashibai Navale College  
of Engineering, Vadgaon, Pune - 41.

Name :- Ashish Suryakant Kenjale

Roll.No :- FI246

Exam No :- F190360029

Sub :- Eng. Mechanics

Date :- 16/05/2023

Div :- 14

P.R. Yelpale  
16/5

Q1 or Q2			Q3 or Q4			Total	Sign
A	B	C	A	B	C		
6	5	4	3	1	0	19 30	17/5/23

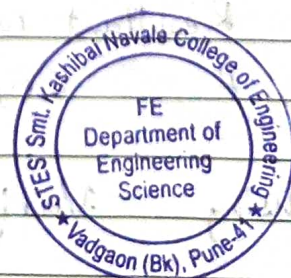
+03

changed marks 19+03

22  
30

P. Y. Yelpale

19/05/23





As :-

$$\Rightarrow \tan \alpha = \frac{P \sin \theta}{Q + P \cos \theta}$$

$$\Rightarrow \tan \alpha = \frac{1523.760}{4761.6}$$

$$\Rightarrow \tan \alpha = 0.320$$

$$\Rightarrow \alpha = \tan^{-1}(0.320)$$

$$\Rightarrow \alpha = 17.744^\circ$$

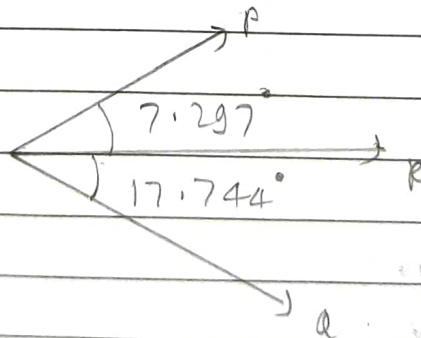
$\Rightarrow$  As

$$\Rightarrow \theta = \alpha + \beta$$

$$\Rightarrow \beta = \theta - \alpha$$

$$\Rightarrow \beta = 7.297^\circ$$

So we get the direction of components P and Q wrt force R.

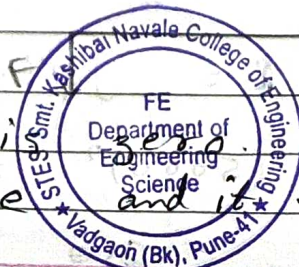


Q1)

When 2 forces equal and opposite in magnitude act along a known or definite distance then it is called as a couple.

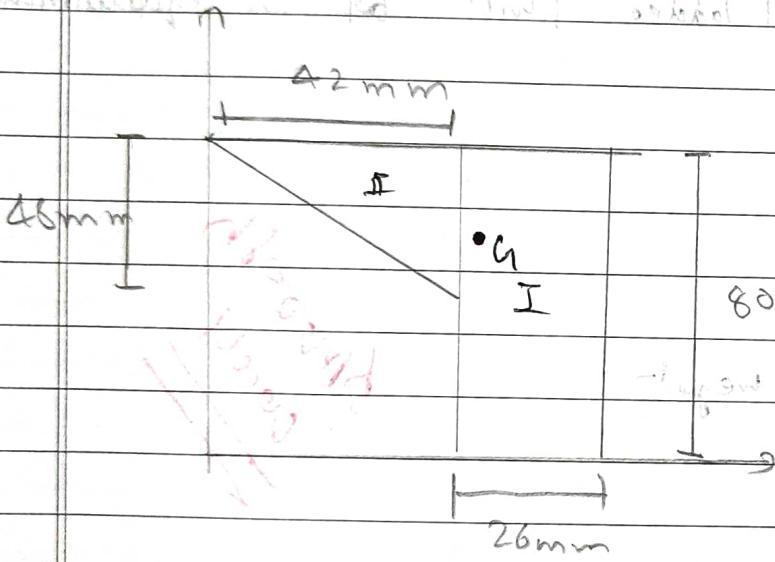
Characteristics :-

- 1) Resultant force in couple is zero.
- 2) Couple has rotational sense and it rotates along a single point.



Q4) a)

Shape	Area	$\bar{x}$	$\bar{y}$	$A\bar{x}$	$A\bar{y}$
① Rectangle	2080 mm <sup>2</sup>	55 mm	40 mm	114400 mm <sup>3</sup>	83200 mm <sup>3</sup>
② Right angled $\Delta$	1008 mm <sup>2</sup>	28 mm	64 mm	28224 mm <sup>3</sup>	64512 mm <sup>3</sup>
	<b>3088 mm<sup>2</sup></b>			<b>142624 mm<sup>3</sup></b>	<b>147712 mm<sup>3</sup></b>

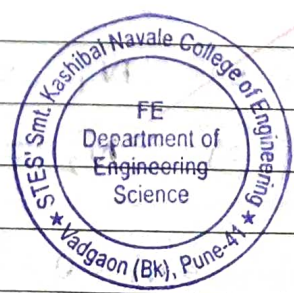


$\Rightarrow G (46.186 \text{ mm}, 47.834 \text{ mm})$

$$\Rightarrow \bar{x} = \frac{\sum(A\bar{x})}{\sum A} = \frac{142624}{3088} = 46.186 \text{ mm}$$

$$\Rightarrow \bar{y} = \frac{\sum(A\bar{y})}{A} = \frac{147712}{3088} = 47.834 \text{ mm}$$

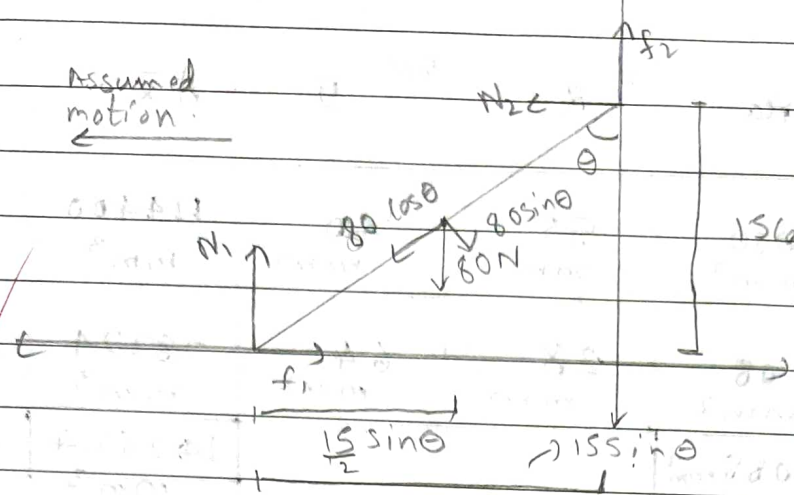
OB FOR



Q4)

b)

Assumed motion



Given:  $\mu = 0.4$  for all surfaces

(2) weight of ladder = 80 N.

Before slipping the ladder will be in equilibrium.

①

$\sum F_x = 0$

$\Rightarrow f_1 - N_2 = 0$

$\Rightarrow f_1 = N_2$

$\Rightarrow \text{As } f_1 = \mu N_1 \text{ we get}$

$\Rightarrow 0.4 N_1 = N_2$

Smooth  
coaxial

②

$\sum F_y = 0$

$\Rightarrow N_1 + f_2 - 80 = 0$

$\Rightarrow N_1 + (\mu N_2) - 80 = 0$

$\Rightarrow N_1 + 0.4 N_1 = 80$

$\Rightarrow N_1 = \frac{80}{1.4}$

$\Rightarrow N_1 = 68.965 \text{ N}$

$\Rightarrow N_2 = 0.4 N_1 = 27.586 \text{ N}$

Here  $f_2 = \mu N_2$

③

$\sum M = 0$



$$\Rightarrow f_2 (15 \sin \theta) - 80 \times \frac{15}{2} \sin \theta + 15 \cos \theta \times N_2 = 0.$$

$$\Rightarrow (\mu N_2) (15 \sin \theta) - 40 \times 15 \sin \theta + 15 \cos \theta N_2 = 0$$

$\Rightarrow$  Dividing by  $15 \cos \theta$ .

$$\Rightarrow \mu N_2 \tan \theta - 40 \tan \theta + N_2 = 0.$$

$$\Rightarrow 11.034 \tan \theta - 40 \tan \theta = -N_2$$

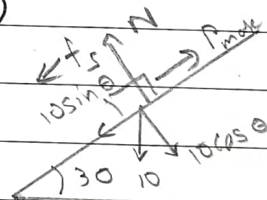
$$\Rightarrow -28.960 \tan \theta = -27.586$$

$$\Rightarrow \tan \theta = 0.952$$

$\Rightarrow$   $\theta = 43.591^\circ$  is the required <sup>min</sup> value of  $\theta$  for the ladder to slip.

Q4) c)

friction  $\leftarrow$  motion (impending)  $\rightarrow$



for equilibrium.

$$f_s = \mu N \quad (1)$$

$$\Rightarrow \sum f_y = 0$$

$$\Rightarrow W = 10 \cos 30 = \frac{10\sqrt{3}}{2}$$

$$\Rightarrow f_s = 0.25 \times \frac{10\sqrt{3}}{2}$$

$$\boxed{f_s = 3.061 \text{ N}}$$

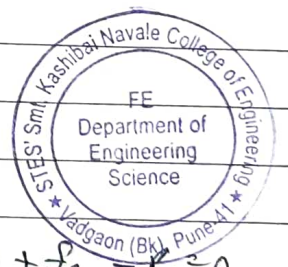
$$\sum f_x = 0.$$

$$\Rightarrow 10 \sin \theta + f_s - P = 0$$

$$\Rightarrow P = \frac{10}{2} + 0.25 \times \frac{10\sqrt{3}}{2}$$

$$\Rightarrow \boxed{P = 8.061 \text{ N}}$$

$\therefore$  The max value of  $P$  for equilibrium.





Sinhgad Institutes

Sinhgad Technical Education Society's

Smt. Kashibai Navale College of Engg., Pune – 41

Department of Engineering Sciences

Date: 18/05/23

To,

The Subject Teacher,

FE Engineering Science,

Sub: Regarding grievance in Unit Test/Prelim Exam Marks

Respected Sir/Mam,

I, Ashish Suryakant Kenjale .....student of  
First year, division.....14.....Roll no.....FI1246..... appeared UT-I/UT-  
II/Prelim examination of Subject.....Engg. Mechanics.....on.....16/05/2023.....

The marks secured by me in the said exam are.....19..... I have grievance  
related to marks secured in the said subject examination.

This is my kind request to subject teacher to kindly address my grievance  
related to marks secured in the said subject examination.

Name and Sign of the student

( A. S. Kenjale )

Remark of Subject Teacher: Marks changed, from 19 to 22.  
(Que No 2a - table marks increased by 3)  
(Decimal point variation in answer hence marks were  
not considered)

Subject Teacher  
Ms. N. B. Patil



Exam Co-ordinator.

Name: Somwane, Gaurav. Nitin,

Div: 8

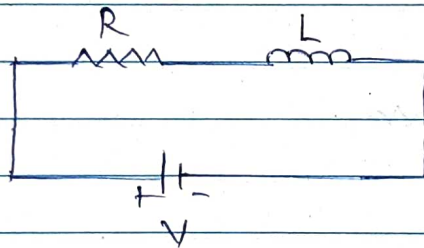
Subject: Basic Electrical Engineering

Roll No: PC 1118

12/08

Q.1 or Q.2	Q.3 or Q.4	Q.5 or Q.6	Q.7 or Q.8	Total
a b c	a b c	a b c	a b c	
4 6 7	3 - -	4 5 -	- - 1	$\frac{30}{70}$ <u>SW</u>

Q.2) a)



$\frac{30}{70}$  SW  
No change

$$V = V_m \sin \omega t$$

$$I = I_m \sin \left( \omega t - \frac{\pi}{2} \right)$$

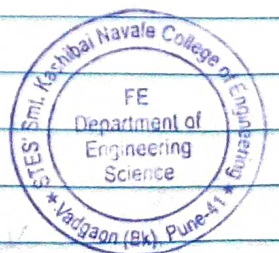
$$\therefore V = -L \cdot \frac{dI}{dt}$$

$$\therefore dI = \frac{V \cdot dt}{L}$$

$$\therefore \int dI = \int \frac{V}{L} \cdot dt$$

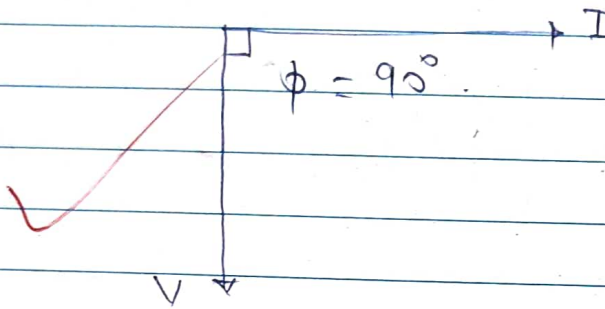
$$\therefore I = \frac{1}{L} \int V_m \sin \omega t \cdot dt$$

$$I = \frac{1}{L} \cdot V_m \frac{(-\cos \omega t)}{\omega}$$

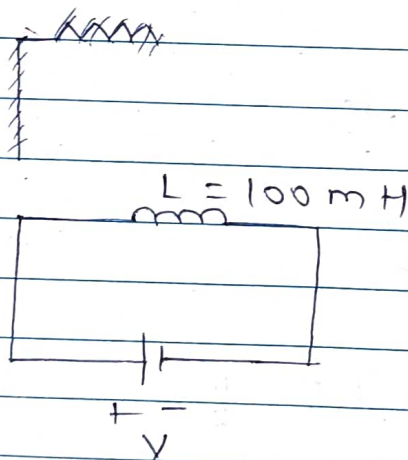


$$I = \frac{V_m}{\omega L} (-\cos \omega t)$$

$$\therefore I = \frac{V_m}{\omega L} \sin(\omega t - \frac{\pi}{2})$$



b)



Given:  $L = 100 \text{ mH} = 100 \times 10^{-3} = 10^{-1}$

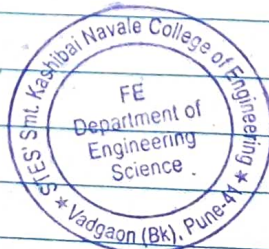
$L = 0.1 \text{ H}$

$V = 100 \sin(314 t)$

$V = V_m \sin \omega t$

$V_m = 100 \text{ V}$

$\omega = 314$



$$2\pi P = 314$$

$$\therefore P = \frac{314}{2\pi}$$

$$P = 49.97 \text{ Hz}$$

$$\therefore X_L = \omega L$$
$$= 314 \times 0.1$$

$$X_L = 31.4 \Omega$$

$$\therefore I = I_m \sin\left(\omega t - \frac{\pi}{2}\right)$$

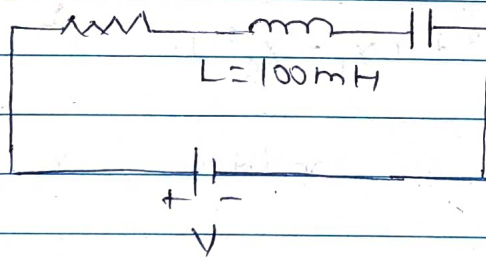
$$I = \frac{100}{31.4} \sin\left(314t - \frac{\pi}{2}\right)$$

$$\therefore I = 3.18 \sin\left(314t - \frac{\pi}{2}\right) \text{ A}$$

c)

$$R = 20 \Omega$$

$$C = 100 \mu\text{F}$$



Given:  $R = 20 \Omega$

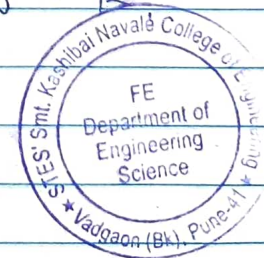
$$L = 100 \text{ mH} = 100 \times 10^{-3} = 0.1 \text{ H}$$

$$C = 100 \mu\text{F} = 100 \times 10^{-6} = 10^{-4} \text{ F}$$

$$V_{\text{rms}} = 230 \text{ V}$$

$$\therefore X_L = X_C$$

$$\omega L = \frac{1}{\omega C}$$





$$\therefore \omega^2 = \frac{1}{LC}$$

$$(2\pi P)^2 = \frac{1}{LC}$$

$$4\pi^2 P^2 = \frac{1}{LC}$$

$$\therefore P^2 = \frac{1}{4\pi^2 LC}$$

$$\therefore P = \frac{1}{2\pi \sqrt{LC}}$$

$$= \frac{1}{2\pi \sqrt{0.1 \times 10^{-4}}}$$

$$\therefore P = \cancel{0.316} \text{ Hz} \quad 50.36 \text{ Hz}$$

$$\therefore Z = \sqrt{R^2 + (X_L - X_C)^2}$$

At resonance condition;  $X_L = X_C$

$$\therefore Z = \sqrt{R^2 + (0)^2}$$

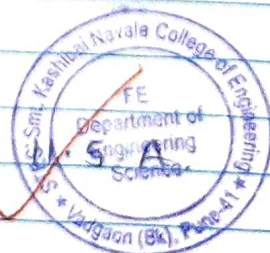
$$Z = \sqrt{R^2}$$

$$Z = R$$

$$Z = 20 \Omega$$

$$V_{\text{rms}} = I_{\text{rms}} \times Z$$

$$\therefore I_{\text{rms}} = \frac{230}{20} =$$



Q.4)

a) 1) Apparent Power (S): It is the actual Power drawn/consumed by the circuit. It is denoted by S.  $\therefore S = V \cdot I$ . It's unit is Volt-Ampere (VA).

2) <sup>Active</sup> ~~Reactive~~ Power (P): It is the product of supplied voltage and reactive component of current ( $I \cos \phi$ ).  
 $\therefore P = V \cdot (I \cos \phi) = VI \cos \phi$ . It is denoted by P. It's unit is Watt (W).

3) Reactive Power (Q): It is the product of supplied voltage and ~~rea~~

1) Active Power (S): It is the actual Power drawn/consumed by the circuit. It is denoted by S.  
 $\therefore S = V \cdot I$ . It's unit is Volt-Ampere (VA).

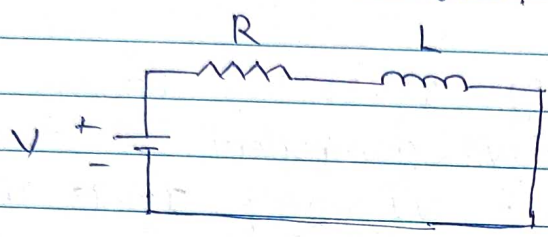
2) Active Power (P): It is the product of supplied voltage and active component of current ( $I \cos \phi$ ).  
 $\therefore P = V \cdot (I \cos \phi)$ ;  $P = VI \cos \phi$ . It is denoted by P. It's unit is Volt Watt (W).

3) Reactive Power (Q): It is the product of supplied voltage and Reactive component of current ( $I \sin \phi$ ).  
 $\therefore Q = V \cdot (I \sin \phi) = V \cdot I \sin \phi$ . It is denoted by Q. It's unit is VAR.



Q.5)

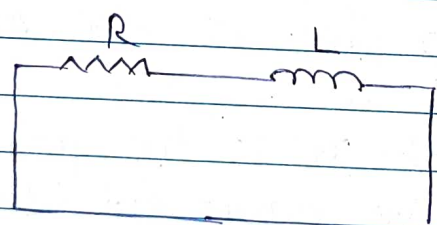
a) 1) Active Network: The network in which there is at least one voltage source or current source is called as Active Network.



2) Passive Network: The network in which there is one or more voltage source or current source is called as Passive Network.

3) Passive Network: The network in which there is no voltage source or current source is called as Passive Network.

4



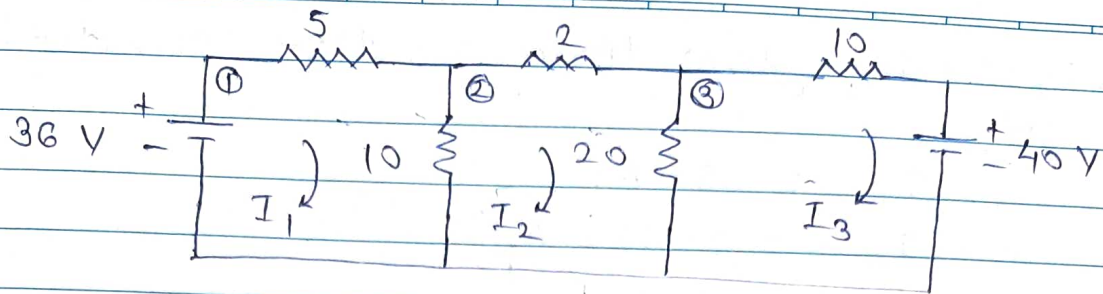
4) 1) Unilateral: The network in which the current flows in only one direction is called as Unilateral network.

4  
✓

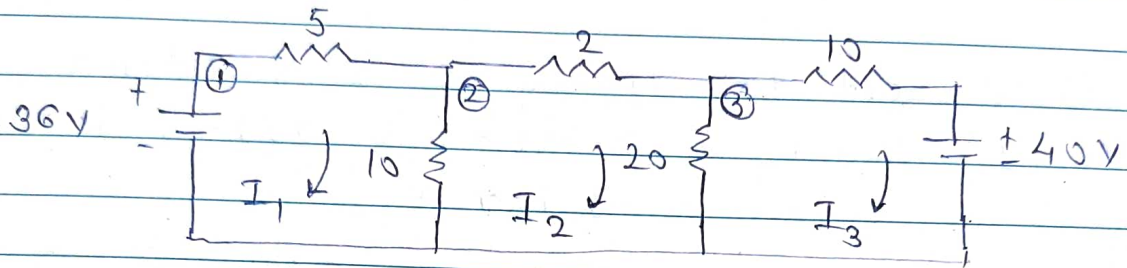
2) Bilateral: The network in which the current flows in both the direction is called as Bilateral Network.



b)



A



Applying K.V.L at loop 1;

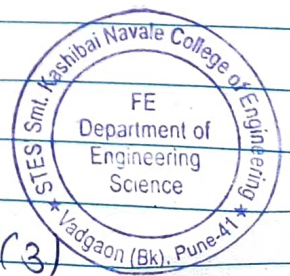
$$\begin{aligned}
 36 &= 5I_1 + 10(I_1 - I_2) \\
 36 &= 5I_1 + 10I_1 - 10I_2 \\
 36 &= 15I_1 - 10I_2 \quad \text{--- (1)}
 \end{aligned}$$

Applying K.V.L at loop 2;

$$\begin{aligned}
 0 &= 2I_2 + 20(I_2 - I_3) + 10(I_2 - I_1) \\
 0 &= 2I_2 + 20I_2 - 20I_3 + 10I_2 - 10I_1 \\
 0 &= 32I_2 - 20I_3 - 10I_1 \\
 0 &= -10I_1 + 32I_2 - 20I_3 \quad \text{--- (2)}
 \end{aligned}$$

Applying K.V.L at loop 3;

$$\begin{aligned}
 -40 &= 10I_3 + 20(I_3 - I_2) \\
 -40 &= 10I_3 + 20I_3 - 20I_2 \\
 -40 &= -20I_2 + 30I_3 \quad \text{--- (3)}
 \end{aligned}$$



By solving above three equations simultaneously we get;

$$I_1 = 2.251 \text{ A};$$

$$I_2 = -0.222 \text{ A};$$

$$I_3 = -1.481 \text{ A}.$$

∴ Current through  $2 \Omega$  resistance =

$$I_1 - I_2 - I_3 = 2.251 - (-0.222) - (-1.481) \\ = 3.954 \text{ A},$$

$$\therefore I_{2\Omega} = 3.954 \text{ A}.$$

Q.8)

c)

Given: At  $20^\circ\text{C}$   $R = 10 \Omega$

At  $0^\circ\text{C}$   $\text{RTC} = \alpha_0 = 0.004/^\circ\text{C}$ .

$$\therefore R_2 - R_1 = R_1 \alpha_0 (T_2 - T_1)$$

$$R_2 = R_1 + R_1 \alpha_0 (T_2 - T_1)$$

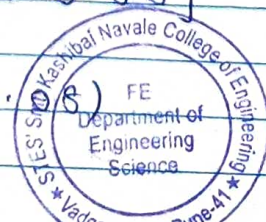
$$\therefore R_2 = R_1 [1 + \alpha_0 (T_2 - T_1)]$$

$$\therefore 10 = R_1 [1 + 0.004 (20 - 0)]$$

$$10 = R_1 [1 + 0.004 (20)]$$

$$10 = R_1 [1 + 0.08]$$

$$\therefore 10 = R_1 \times 1.08$$



$$R_1 = \frac{10}{1.08} = 9.259 \Omega$$

i) RTC at  $20^\circ\text{C}$ ;

$$R_2 - R_1 = R_1 \cdot \alpha \cdot (T_2 - T_1)$$

$$10 - 9.259 = 9.259 \times \alpha \cdot (20 - 0)$$

$$0.741 = 9.259 \times \alpha \times 20$$

$$\therefore \alpha = \frac{0.741}{9.259 \times 20}$$

$$\therefore \alpha = 4.001 \times 10^{-3}$$

∴ RTC at  $20^\circ\text{C}$  is  $4.001 \times 10^{-3} / ^\circ\text{C}$ .

ii) Resistance of wire at  $50^\circ\text{C}$

$$R_2 - R_1 = R_1 \cdot \alpha \cdot (T_2 - T_1)$$

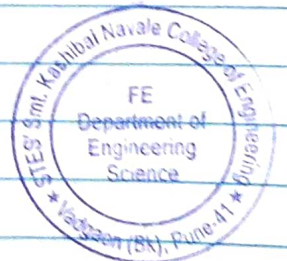
$$R_2 - 10 = 10 \times 4.001 \times 10^{-3} \times (50 - 20)$$

$$\therefore R_2 - 10 = 10 \times 4.001 \times 10^{-3} \times 30$$

$$R_2 - 10 = 1.2003$$

$$R_2 = 11.2003 \Omega$$

iii) The temperature at which resistance increases to  $15 \Omega$ .



$$\therefore R_2 - R_1 = R_1 \alpha (T_2 - T_1)$$

$$15 - 10 = 10 \times \alpha \times (T_2 - 20)$$

$$\therefore 15 - 10 = 10 \times 4.001 \times 10^{-3} \times (T_2 - 20)$$

$$\therefore 5 = 10 \times 4.001 \times 10^{-3} \times (T_2 - 20)$$

$$5 = 0.04 \times (T_2 - 20)$$

$$\therefore T_2 - 20 = 125$$

$$\therefore T_2 = 145^\circ \text{C}$$

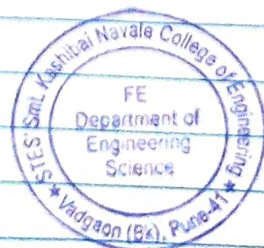
Q.2)

c) Power Factor (P.F) =  $\cos \phi$

$$= \frac{R}{Z}$$

$$= \frac{20}{20}$$

$$\therefore \text{P.F} = 1$$



Date: 14/07/2023

To,  
The Subject Teacher,  
FE Engineering Science,  
Sub: Regarding grievance in Unit Test/Prelim Exam Marks

Respected Sir/Mam,

I, ..... Sonawane Gaurav Nitin ..... student of  
First year, division.....8..... Roll no.....FC1118..... appeared UT-I/UT-  
II/Prelim examination of Subject.....BEE..... on.....12/07/23.....

The marks secured by me in the said exam are.....30..... I have grievance  
related to marks secured in the said subject examination.

This is my kind request to subject teacher to kindly address my grievance  
related to marks secured in the said subject examination.



Name and Sign of the student

( G. N. Sonawane )

Remark of Subject Teacher: No change



Subject Teacher

R.B. Shirsath





Exam Co-ordinator.