

Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

SE (Elect), sem-IV, 15/6/15
Engineering Mathematics-IV

June 2015

Total Marks: 100

Duration: 3 Hours

CLASS/SEM: S.E (ELECTRICAL)/IV (RE-EXAMINATION)

SUBJECT: ENGINEERING MATHEMATICS IV

- Attempt any FIVE questions out of SEVEN questions.
- Answers to all sub questions should be grouped together.
- Figures to the right indicate full marks.

Master

- Q1.a) Prove that $A = \begin{bmatrix} -i & 3+2i & -2-i \\ -3+2i & 0 & 3-4i \\ 2-i & -3-4i & -2i \end{bmatrix}$ is skew-Hermitian matrix. 06
- Q1.b) To verify whether a course in accounting improved performance, a similar test was given to 12 participants both before and after the course. The original marks recorded in alphabetical order of the participants were 44, 40, 61, 52, 32, 44, 70, 41, 67, 72, 53 and 72. After the course, the marks were in the same order 53, 38, 69, 57, 46, 39, 73, 48, 73, 74, 60 & 78. Was the course useful? 06
- Q1.c) A drawer contains 50 bolts and 150 nuts. Half of the bolts and half of the nuts are rusted. If one item is chosen at random, what is the probability that it is rusted or is a bolt? 08
- Q2.a) If the mean of a binomial distribution is 3 and the variance is $\frac{3}{2}$, find the probability of obtaining atleast 4 success. 06
- Q2.b) Determine values of P, Q, R when $\begin{bmatrix} 0 & 2Q & R \\ P & Q & -R \\ P & -Q & R \end{bmatrix}$ is orthogonal 06
- Q2.c) Find non-singular matrices P, Q so that PAQ is a normal form where $A = \begin{bmatrix} 2 & 1 & -3 & -6 \\ 3 & -3 & 1 & 2 \\ 1 & 1 & 1 & 2 \end{bmatrix}$ 08
- Q3.a) A square matrix A is defined by $A = \begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$. Find the modal matrix P and the resulting diagonal matrix D of A. 06

Engineering Mathematics - IV

- Q3.b) The probability that a smoker aged 25 years will die before reaching the age of 30 years may be taken a 0.018. Out of a group of 400 smokers, now aged 25 years, what is the probability that 2 smokers will die within the next 5 years? 06
- Q3.c) The theory predicts the proportions of bean in the four groups A, B, C & D should be 9:3:3:1. 08
In an experiment among 1600 beans, the number in the four group are 882, 313, 287 & 118.
Does the experimental result support the theory? 06

Q4.a) Find if matrix $A = \begin{bmatrix} -1 & 0 & 0 \\ 1 & -1 & 1 \\ 1 & 0 & 1 \end{bmatrix}$ is derogatory. 06

Q4.b) If $A = \begin{bmatrix} \pi/2 & 3\pi/2 \\ \pi & \pi \end{bmatrix}$ find $\sin A$. 06

Q4.c) In a distribution exactly 7% of items are under 35 and 89% are under 63. What are the mean and standard deviation? 08

Q5.a) Compute Spearman's rank correlation coefficient for the following data 06

X	18	20	34	52	12
Y	39	23	35	18	46

Q5.b) Find the characteristic equation of the matrix $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$. Verify Cayley - Hamilton theorem and hence evaluate the matrix equation. 06

theorem and hence evaluate the matrix equation.

$$A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 - 8A^2 + 2A - I$$

Q5.c) In an examination marks obtained by students in mathematics, physics and chemistry are normally distributed with means 51, 53 and 46 with standard deviations 15, 12, 16 respectively. Find the probability of securing total marks (i) 180 or more (ii) 90 or below 08

Q6.a) For a random sample of 10 pigs fed diet A, the increases in weight in pounds in a certain period were 10, 6, 16, 17, 13, 12, 8, 14, 15, 9. For another random sample of 12 pigs, fed on diet B, the increase in the same period were 7, 13, 22, 15, 12, 14, 18, 8, 21, 23, 10, 17. Test whether the diets A & B differ significantly as regards their effect on increase in weight 06

Q6.b) Find the eigen values and eigenvectors of the matrix $A = \begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$ 06

Q6.c) Calculate the correlation coefficient for the following data: 08

X	9	8	7	6	5	4	3	2	1
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Y	15	16	14	13	11	12	10	8	9
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Q7.a) Fit a binomial distribution for the following data and compare the theoretical frequencies with the actual ones: 06

X	0	1	2	3	4	5
f(x)	2	14	20	34	22	8

Q7.b) For what values of 'a' and 'b' the equations 06

$$x + 2y + 3z = 4$$

$$x + 3y + 4z = 5$$

$$x + 3y + az = b$$

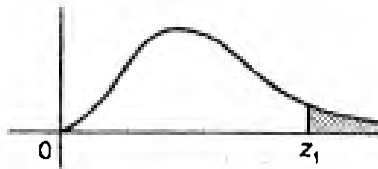
Have

- i) No solution
- ii) A unique solution
- iii) Infinite number of solutions

Q7.c) 08

Express the matrix $A = \begin{bmatrix} 1+i & 2 & 5-5i \\ 2i & 2+i & 4+2i \\ -1+i & -4 & 7 \end{bmatrix}$ as the sum of Hermitian matrix and skew-Hermitian matrix.

Percentage Points of χ^2 - Distribution



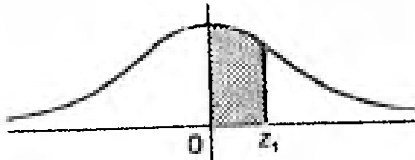
Example

For $\Phi = 10$ d. o. f.

$P(\chi^2 > 15.99) = 0.10$

$\Phi \backslash P$	0 = .99	0.95	0.50	0.10	0.05	0.02	0.01
1	.000157	.00393	.455	2.706	3.841	5.214	6.635
2	.0201	.103	1.386	4.605	5.991	7.824	9.210
3	.115	.352	2.366	6.251	7.815	9.837	11.341
4	.297	.711	3.357	7.779	9.488	11.668	13.277
5	.554	1.145	4.351	9.236	11.070	13.388	15.086
6	.872	1.635	5.348	10.645	12.592	15.033	16.812
7	1.339	2.167	6.346	12.017	14.067	16.622	18.475
8	1.646	2.733	7.344	13.362	15.507	18.168	20.090
9	2.088	3.325	8.343	14.684	16.919	19.679	21.666
10	2.558	3.940	9.340	15.987	18.307	21.161	23.209
11	3.053	4.575	10.341	17.275	19.675	22.618	24.725
12	3.571	5.226	11.340	18.549	21.026	24.054	26.217
13	4.107	5.892	12.340	19.812	22.362	25.472	27.688
14	4.660	6.571	13.339	21.064	23.685	26.873	29.141
15	4.229	7.261	14.339	22.307	24.996	28.259	30.578
16	5.812	7.962	15.338	23.542	26.296	29.633	32.000
17	6.408	8.672	16.338	24.769	27.587	30.995	33.409
18	7.015	9.390	17.338	25.989	28.869	32.346	34.805
19	7.633	10.117	18.338	27.204	30.144	33.687	36.191
20	8.260	10.851	19.337	28.412	31.410	35.020	37.566
21	8.897	11.591	20.337	29.615	32.671	36.349	38.932
22	9.542	12.338	21.337	30.813	33.924	37.659	40.289
23	10.196	13.091	22.337	32.007	35.172	38.968	41.638
24	10.856	13.848	23.337	32.196	36.415	40.270	42.980
25	11.524	14.611	24.337	34.382	37.652	41.566	44.314
26	12.198	15.379	25.336	35.363	38.885	41.856	45.642
27	12.879	16.151	26.336	36.741	40.113	44.140	46.963
28	13.565	16.926	27.336	37.916	41.337	45.419	48.278
29	14.256	17.708	28.336	39.087	42.557	46.693	49.588
30	14.953	18.493	29.336	40.256	43.773	47.962	50.892

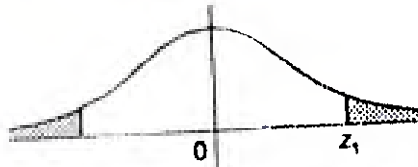
Area Under Standard Normal Curve



The table gives the area under the standard normal curve from $z = 0$ to $z = z_1$ which is the probability that z will lie between $z = 0$ and $z = z_1$.

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2703	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4415	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4884	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

Percentage Points of t -distribution



Example

For $\Phi = 10$ d. o. f.

$P(|t| > 1.812) = 0.1$

Φ	P	0.20	0.10	0.05	0.02	0.01
1		3.078	6.314	12.706	31.812	63.657
2		1.886	2.920	4.303	6.965	9.925
3		1.638	2.353	3.182	4.541	5.841
4		1.533	2.132	2.776	3.747	4.604
5		1.476	2.015	2.571	3.365	4.032
6		1.440	1.943	2.447	3.143	3.707
7		1.415	1.895	2.365	2.998	3.499
8		1.397	1.860	2.306	2.896	3.355
9		1.383	1.833	2.262	2.821	3.250
10		1.372	1.812	2.228	2.764	3.169
11		1.363	1.796	2.201	2.718	3.106
12		1.356	1.782	2.179	2.681	3.055
13		1.350	1.771	2.160	2.650	3.012
14		1.345	1.761	2.145	2.624	2.977
15		1.341	1.753	2.131	2.602	2.947
16		1.337	1.746	2.120	2.583	2.921
17		1.333	1.740	2.110	2.567	2.898
18		1.330	1.734	2.101	2.552	2.878
19		1.328	1.729	2.093	2.539	2.861
20		1.325	1.725	2.086	2.528	2.845
21		1.323	1.721	2.080	2.518	2.831
22		1.321	1.717	2.074	2.508	2.819
23		1.319	1.714	2.069	2.500	2.807
24		1.318	1.711	2.064	2.492	2.797
25		1.316	1.708	2.060	2.485	2.287
26		1.315	1.706	2.056	2.479	2.779
27		1.314	1.703	2.052	2.473	2.771
28		1.313	1.701	2.048	2.467	2.763
29		1.311	1.699	2.045	2.462	2.756
30		1.310	1.697	2.042	2.457	2.750
40		1.303	1.684	2.021	2.423	2.704
60		1.296	1.671	2.000	2.390	2.660
120		1.289	1.658	1.980	2.358	2.617
		1.282	1.645	1.960	2.325	2.576

Page 6

SARDAR PATEL COLLEGE OF ENGINEERING

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EE256 Environmental Engineering and Management System

SE (Elect), Sem-IV

Exam : End semester

Time : 2 hr

Marks : 50

Instructions :

Date : 11/5/2015

- i) Attempt **any Five** out of **Seven** Questions.
- ii) Figures in brackets indicate marks for particular question.
- iii) Draw neat and labelled diagram wherever necessary
- iv) Attempt suitable data if necessary

Master

1. (a) Briefly explain about the following : (5)
(i) Air Pollution (ii) Water Pollution (iii) Noise pollution (iv) Sustainable Development
(b) Give a brief introduction about Environmental Management System? (5)
2. (a) Briefly explain the international standard Methodology of PDCA ? (5)
(b) What is covered in Biological Diversity Act (2002) ? (5)
3. (a) Explain about "Kyoto protocol"? (5)
(b) Give reasons for why to conserve Wetland? (5)
4. (a) Explain why and where Ramsar Convention was adopted? Explain about the Wetland and its different types? (5)
(b) What are the different economics benefits that wetland provides? (5)
5. (a) Explain about GRIHA its philosophy and the rating system? (5)
(b) What are the different steps involved in getting the building rated? (5)

SE (Elect), Sem - IV, 11/5/15,

Environmental Engineering & management system

6. (a) Explain Why and When the CITES came into force? (5)
(b) What are the different reform suggestions in the operation of CITES? (5)

7. (a) How do building impact environment? (5)
(b) Describe What is a Green Building? (5)

SE (Elect), Sem-IV, Re-exam, 20/6/15.
Signals and Systems.

Lib
20/06/15

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SARDARPATEL COLLEGE OF ENGINEERING

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First Half 2015

RE Examination

Total Marks : 100

Duration : 3 Hours

CLASS/SEM: SE/IV (Elect).

SUBJECT: Signals and System

Subject code: EE255

- Question no. One is **Compulsory**.
- Attempt any Four question out of remaining SIX questions
- Answers to all sub questions should be grouped together
- Figures to the right indicate full marks
- In the absence of any data, make suitable assumptions and justify the same.

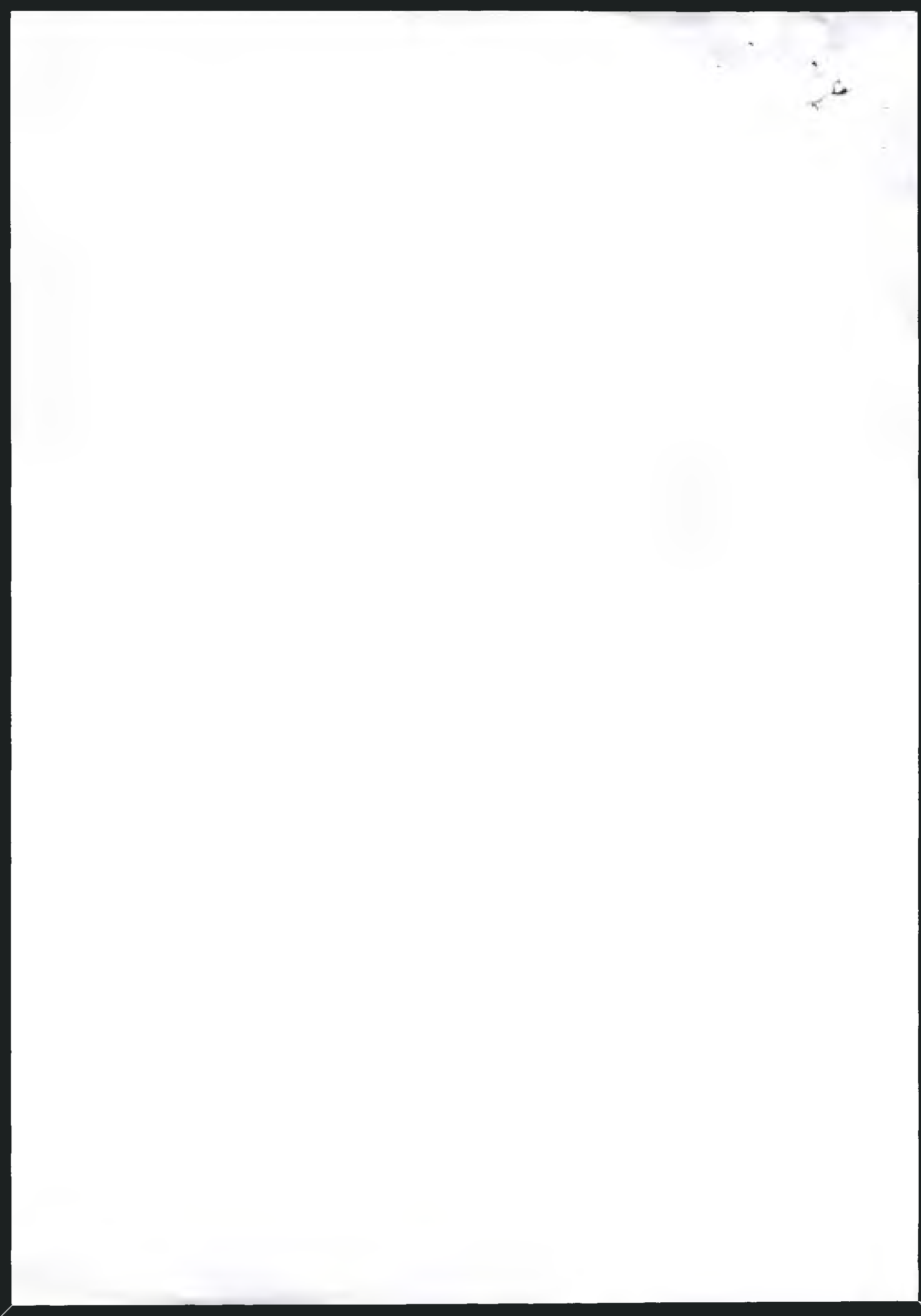
Master

Q.1)	Solve any Four	
	a) Calculate the output signal $y(n)$ if input $x(n) = \{-4, -6, 1\}$ and impulse response of the system is $h(n) = \{-4, 10, -1\}$.	05
	b) Determine Fourier series coefficients (in exponential form) of a signal $x(t) = 1 + \sin(2\omega_0 t) + 4 \cos(2\omega_0 t) + 2 \cos(4\omega_0 t)$ with fundamental frequency as ω_0 .	05
	c) Evaluate $x[n]$ if $X(z) = \frac{1}{(1 - \frac{1}{5}z^{-1})(1 - \frac{1}{8}z^{-1})}$.	05
	d) Test if $x[n] = (-1)^n$ is periodic. If periodic determine fundamental time Period.	05
	e) Find Laplace Transform of $f(t) = e^{8t} u(-t) + e^{-2t} u(t)$.	05
Q.2)	a) Consider a LTI system with frequency response $H(j\omega) = \frac{j\omega + 1}{(j\omega + 5)(j\omega + 2)}$. Determine its impulse response. For a given input $x(t) = e^{-3t} u(t)$ evaluate $y(t)$.	10
	b) Calculate DTFT of $\{2, 6, -1, 8, 9\}$	10

SE (Elect), Sem- IV, Re-exam, 2016/15
Signals and Systems

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Q.7)	a) Determine inverse Fourier transform of a Discrete signal $x[n]$ if	10
	$X(e^{j\omega}) = \frac{1}{(1 - ae^{-j\omega})^2}$	10
	b) State and prove time shifting and time scaling property of Z-Transform.	



SE (Elect), Sem - IV, 9/5/15
 Signals & Systems

09/05/15
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 Sardar Patel College of Engineering, Andheri (W), Mumbai 400 058
 END Semester Examination

Class: S.E. (Electrical) Sem IV

Time: 3 Hr.

Subject: Signals and systems

Marks: 100.

Note :

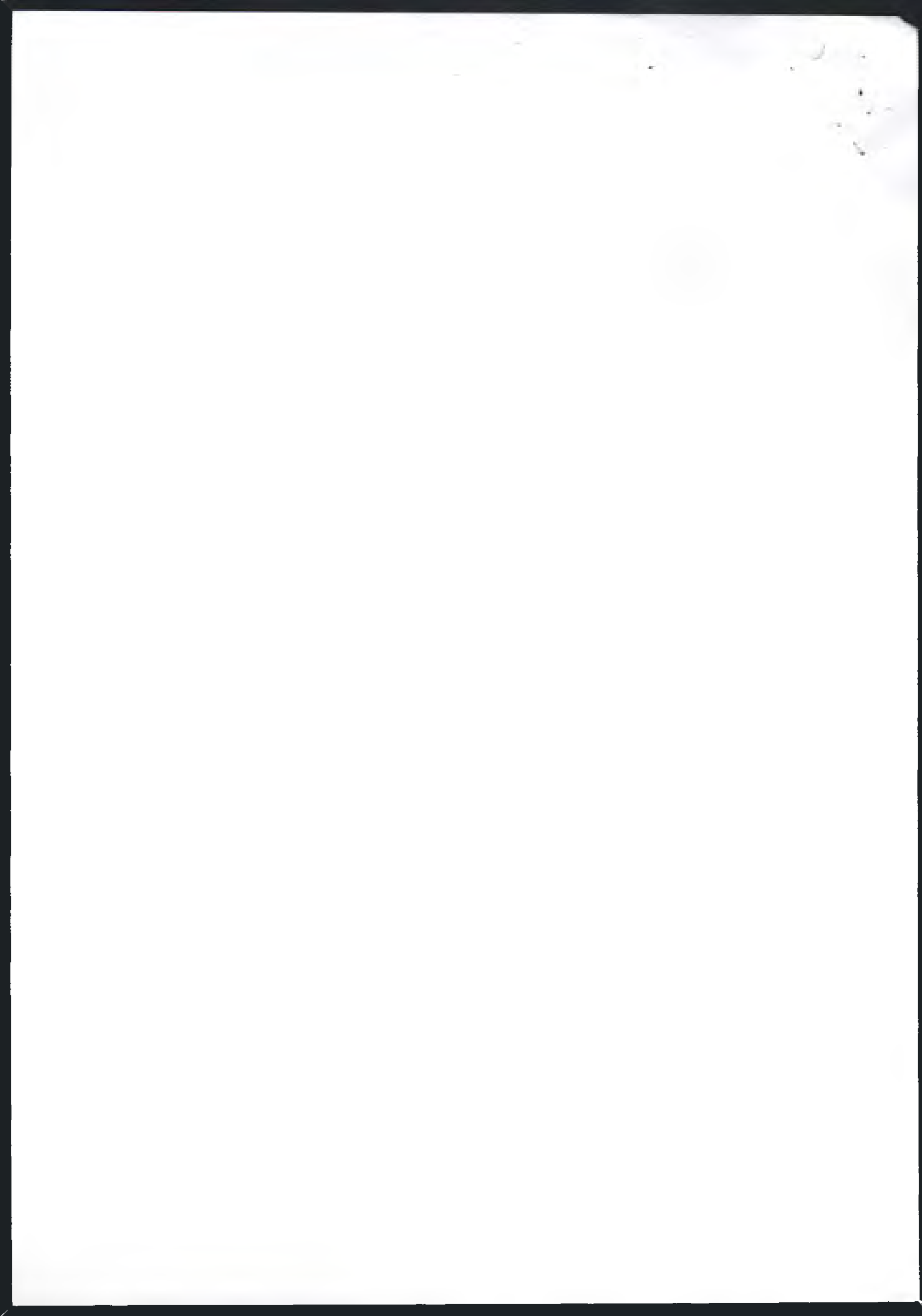
1. Question No 1 is compulsory.
2. Solve any four out of remaining six questions.
3. Figures to the right indicate full marks.
4. In the absence of any data, make suitable assumptions and justify the same.

Master

Q 1	<p>Solve any four.</p> <p>a) Evaluate Fourier Transform of $x(t) = \begin{cases} e^{j10t}, & t \leq 2 \\ 0, & t > 2 \end{cases}$</p> <p>b) Calculate Energy and power of signal $x[n] = -\left(\frac{3}{4}\right)^n u[n]$</p> <p>c) Evaluate Laplace Transform of $x(t) = \sin(at) + t \cos(at)$</p> <p>d) Identify the system if for an input $x[n] = \{-1, 2\}$ it gives output as $y[n] = \{-1, 3, -1, -2\}$.</p> <p>e) Given a realization of a causal DT system as shown in Fig 1., Obtain the transfer function of system.</p>	<p>05</p> <p>05</p> <p>05</p> <p>05</p> <p>05</p>
<p style="text-align: right;">Fig 1</p>		

SE (Elect), sem. IV, 915115
 Signals & Systems

Q 6	<p>a) Calculate zero state response, zero input response and total output of the system described by $3 \frac{d^2y}{dt^2} + 4 \frac{dy}{dt} + y(t) = x(t)$ where $x(t) = 5 u(t)$. Initial conditions in the system are $y(0) = 1$ and $y'(0) = 0$. [Make use of Laplace Transform].</p> <p>b) Given a system with transfer function $H(z) = \frac{1}{(1 + \frac{z^{-1}}{5})(1 + \frac{z^{-1}}{7})}$. Realize the system in direct form, cascade form and parallel form.</p>	10 10
Q 7	<p>a) Determine Fourier Series Coefficients of a periodic sequence $x[n] = \{0, 2, 4, 6\}$. Plot the frequency spectrum.</p> <p>b) Evaluate DTFT of $x[n] = a^{ n }$ where $0 < a < 1$. Plot magnitude spectrum.</p>	10 10 . .



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SARDAR PATEL COLLEGE OF ENGINEERING

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Subject: Elements of power systems Re-exam June 2015

Marks : 100

Class: SE/Electrical / Sem -IV

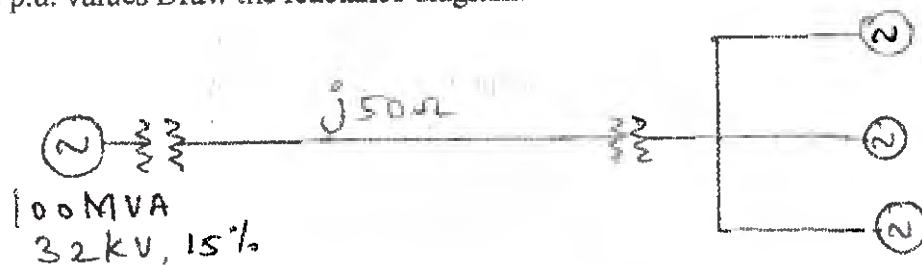
Time : 3 hrs

- Attempt any five of the seven questions .
- Answers to all sub questions should be grouped together.
- Any assumptions must be specified clearly.
- Figures to the right indicate full marks

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Master

- 1a. A 100MVA, 33KV 3 phase generator has a subtransient reactance of 15%. The generator is connected to the motors through a transmission line and transformers as shown. The motors have rated input of 30 MVA, 20 MVA and 50 MVA at 30 kv with 20% subtransient reactance. The three phase transformers are rated at 110MVA, 32KV (delta)/110kv (star) with leakage reactance 8%. The line has a reactance of 50 ohms. Selecting the generator rating as the base quantities in the generator circuit, determine the base quantities in the other parts of the system and evaluate p.u. values Draw the reactance diagram. 15

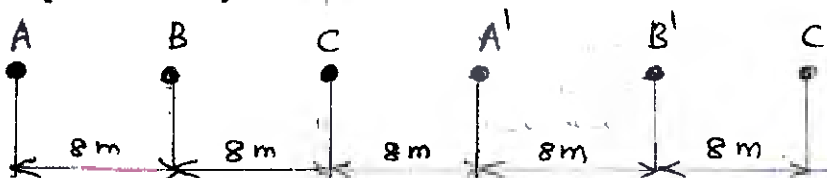


- b. What is Ferranti effect. Deduce an expression for the voltage rise of an unloaded transmission line. 5
- 2a Derive the expression for capacitance of three phase line with unsymmetrical spacing. 10
- b. Obtain the ABCD constants of medium length transmission line assuming π model. Draw the phasor diagram. 10

SECELEET), Sem - IV, Re-edam. 21/6/15
 Element of power systems

- 3a. Write short notes on two part tariff, three part tariff, block rate tariff. 8
- b. A three phase 132 KV transmission line is connected to a 50MW load at a pf of 0.85 lagging. The line constant of the 80km long line are $Z=96\angle 78^\circ\Omega$, $Y=0.001\angle -90^\circ S$. Using nominal T method calculate A,B,C,D constants of the line, sending end voltage, sending end current, sending end pf, and transmission efficiency. Draw the phasor diagram 12
- 4a. What is electric power supply system? Draw a single line diagram of a typical ac power supply scheme 6
- Ob. Discuss the advantages of high transmission voltages. 6
- c.. Discuss the phenomenon of wave reflection and refraction. 8

- 5a. Calculate the inductance per phase per metre for a three phase double circuit line whose phase conductors have a radius of 5.3cm with the horizontal conductor arrangement as shown. 12



- b.. Define critical disruptive and visual critical voltages. Write equations for calculating these voltages. 8
- 6a. Draw a neat schematic diagram of nuclear power plant and explain its operation. 12
- b. In a 33KV overhead line there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self capacitance of each insulator, find the distribution of voltage over 3 insulators and string efficiency. 8
- 7 Answer the following:
- a. Write short notes on skin and proximity effect. 5
- b. Explain the measurement of earth resistance. 5
- c. Write short notes on bundled conductors. 5
- d. Discuss the disadvantages of providing too small or too large sag on a line. 5

Bhartiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(An autonomous institute affiliated to the university of Mumbai)

Subject: Elements of power systems

May 2015

Marks : 100

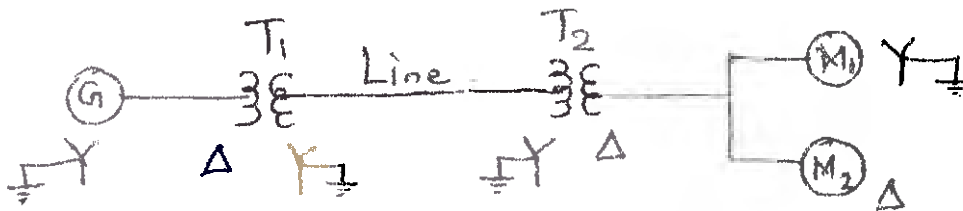
Class: SE Electrical / Sem-IV

Time : 3 hrs

- Attempt any five of the seven questions .
- Answers to all sub questions should be grouped together.
- Any assumptions must be specified clearly.
- Figures to the right indicate full marks

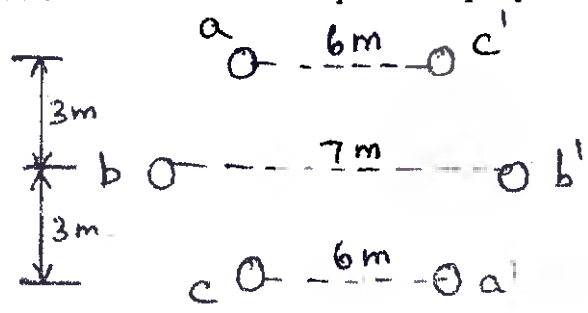
MASTER FILE.

- 1a. What are step potential and touch potential? 5
- b. A 90 MVA, 11 KV 3 Φ generator has a reactance of 25%. The generator supplies two motors through transformers and transmission line as shown in the figure. The transformer T_1 is a 3 Φ transformer, 100MVA, 10/132 KV, 6% reactance. The transformer T_2 is composed of 3 single phase units each rated at 30MVA, 66/10KV with 5% reactance. The connections of T_1 and T_2 are as shown. The motors are rated at 50MVA and 40 MVA both 10 KV and 20% reactance. Taking the generator rating as the base, draw reactance diagram and indicate the reactances in per unit. The reactance of the line is 100 ohms. 15



- 2a. What is transposition? Derive the expression for inductance of three phase line with unsymmetrical spacing. 10
- b. It is required to grade a string having seven suspension insulators. If the pin to earth capacitance are all equal to C determine the line to pin capacitance that would give the same voltage across each insulator of the string. 5
- c. How can string efficiency be improved? 5

- 3a. Explain the variation of current and voltage on an overhead line when one end of the line is i) short circuited ii) open circuited with their reflection and refraction coefficients (waveforms to be drawn) 14
- b. Describe the phenomenon of corona, its advantages and disadvantages. 6
- 4a. What is sag in overhead lines? Deduce an approximate expression for sag in overhead lines when i) supports are at equal levels ii) supports are at unequal levels 10
- b. Using nominal π method find the sending end voltage and voltage regulation of a 250 km long, three phase 50 Hz transmission line delivering 25MVA at 0.8 lagging power factor to a balanced load at 132KV. The line conductors are spaced equilaterally 3m apart. The conductor resistance is $0.11 \Omega/\text{Km}$ and its effective diameter is 1.6cm. 10
- 5a. A three phase double circuit line has configuration as shown. The radius of each conductor is 0.9cm. Find the capacitance per phase per km. 10



- b. Find the critical disruptive and visual critical voltages for local and general corona on a three phase transmission line consisting of three stranded copper conductors spaced 2.5m apart at the corners of equilateral triangle. Air temperature and pressure are 21°C and 73.6cm of Hg. The conductor diameter, irregularity factor and surface factor are 10.4mm, 0.85, 0.7, and 0.8 respectively. 10
- 6a. Explain surge impedance loading. 5
- b. What is tariff? Explain any one type of commonly used tariff. 5
- c. Explain the Layout of thermal power plant. 10
- 7a. Explain the measurement of earth resistance and soil resistivity. 10
- b. Write a note on pin type and suspension type of insulators 10

SE (Elect), Sem -IV, Re-exam, 18/6/15
Electrical to Electronic Measurement.

Lib
18/06/15

BHARATIYA VIDYA BHAVAN'S
SARDAR PATEL COLLEGE OF ENGINEERING
Munshi Nagar, Andheri (West), Mumbai 400 058
[An Autonomous Institution Affiliated to University of Mumbai]

RE-EXAMINATION

SEM/CLASS: IV/SE (Elect)

TOTAL MARKS: 100

SUBJECT: Electrical & Electronic Measurements

DURATION: 3 HOUR

DATE: 18/06/2015

Note: 1. Answer any five questions.

2. Answer to all sub questions should be grouped together.

3. Figures to the right indicate full marks.

Master

- Q1 a. Derive the expression of time constant measurement. Explain how to measure time interval between two events defined by voltage levels. (10)
- b. Explain the working principle of analog instruments in detail with neat diagrams. (10)
- Q2 a. Explain the Maxwell's bridge for inductance measurement by comparison with standard capacitor. Draw the suitable phasor diagram. (10)
- b. Explain the basic block diagram for the digital measurement of a signal in terms of time. Derive the expression for error in time interval measurement between two events. (10)
- Q3 a. Explain the time division multiplexing and sampling theorem in connection with digital measurement. (10)
- b. Explain the process of quantization in detail with suitable example. (05)
- An analog signal lying in a range from 0 to V is to be digitized in a 3 bit format. What is the quantization error? (05)
- Q4 a. Explain the voltage to time converter (VTC) in detail with suitable waveforms. (10)
- b. Derive an expression of ratio error and phase angle error for potential transformer. (10)
- Q5 a. The primary winding exciting current of a current transformer with a bar primary, nominal ratio 100/1, operating on an external burden of 1.6 Ω non inductive, the secondary winding resistance being 0.2 Ω , is 1.9 A, lagging 40.6° to the secondary voltage reversed there being 100 secondary turns. With 1 A flowing in the secondary winding, calculate (a) the actual ratio of primary winding current to secondary winding current, (b) the phase angle between them in degrees. (10)

SECElect), Sem - IV, Re-exam, 18/6/15
Electrical & Electronic Measurement

b. Discuss the major sources of errors in current transformers. Describe the design features used in current transformers to reduce the errors in detail. (10)

Q6 a. A potential transformer, ratio 1000/100 volt, has the following constant: Primary resistance is 94.5Ω , secondary resistance is 0.86Ω , primary reactance is 66.2Ω , total equivalent reactance is 110Ω and no load current is 0.02 A at 0.4 power factor. Calculate 1] phase angle error at no load, 2] burden in VA at unity power factor at which the phase angle will be zero. (10)

b. Define electrical transducers and differentiate between the active and passive transducers explaining suitable example. (10)

Q7. Explain the following in detail. (Any Four) (20)

a. Working principle of Megger.

b. Peak frequency measurement with neat circuit diagram.

c. Indirect type analog to digital converter.

d. Power system frequency deviation measurement.

e. Advantages of Electrical Transducers.

f. Equivalent circuit and phasor diagram of current transformer.

SE (ELECT), Sem IV,
Electrical & Electronic Measurements.

Hib
05/05/15

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Munshi Nagar, Andheri (West), Mumbai 400 058
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END SEMESTER

SEM/CLASS: IV/SE (ELECT)

TOTAL MARKS: 100

SUBJECT: Electrical & Electronic Measurements

DURATION: 3 HOUR

DATE: 05/05/2015

- Note: 1. Answer any five questions.
2. Answer to all sub questions should be grouped together.
3. Figures to the right indicate full marks.

Master

- Q1 a. Explain the working of Wheatstone bridge for the measurement of resistance in detail. Draw the suitable phasor diagram. (10)
b. State the requirements of an ideal phase meter and hence describe the digital phase measurement through time measurement using RS flip flop. (10)
- Q2 a. Explain high frequency measurement using frequency difference expansion method. (10)
b. Explain the fast low frequency measurement of sinusoidally varying signals. (10)
- Q3 a. Explain the process of quantization in detail with suitable example. (05)
A signal lies in the range of 0 to 10 V. Digitize it such that the quantization error is 0.5 V. (05)
b. Explain the sampling theorem and time division multiplexing in connection with digital measurement. (10)
- Q4 a. Explain the indirect type analog to digital converter employing voltage to frequency converter (VFC). (10)
b. Derive an expression of ratio error and phase angle error for current transformer. (10)
- Q5 a. A 100/5 A, 50 Hz current transformer has a bar primary and a rated secondary burden of 12.5 VA. The secondary winding has 196 turns and a leakage inductance of 0.96 mH. With a purely resistive burden at rated full load, the magnetization mmf is 16 A and the loss excitation requires 12 A. Find the ratio and phase angle errors. (10)
b. Discuss the major sources of errors in current transformers. Describe the design features used in current transformers to reduce the errors in detail. (10)

SECRET), Sem. - IV, 5/5/15
Electrical & Electronic Measurements.

- Q6 a. A single phase potential transformer has a turns ratio of 3810/63. The nominal secondary voltage is 63 V and the total equivalent resistance and leakage reactance referred to the secondary side are 2Ω and 1Ω respectively. Calculate the ratio and phase angle errors when the transformer is supplying a burden of $100 + j200 \Omega$. State the assumption made. (10)
- b. Define electrical transducers and differentiate between the primary and secondary transducers explaining suitable example. (10)
- Q7. Explain the following in detail. (Any Four) (20)
- Difference between current transformer and potential transformer.
 - Passive and active transducers with suitable example.
 - Digital ohmmeter.
 - Digital capacitance meter.
 - Advantages of Electrical Transducers.
 - Equivalent circuit and phasor diagram of potential transformer.

lib
27/04/15

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

S.E (ELECT), Sem - IV
Applied Mathematics - IV

APRIL/MAY 2015

Duration: 3 Hours

Total Marks: 100

CLASS/SEM: S.E (ELECTRICAL) IV

SUBJECT: APPLIED MATHEMATICS IV

- Attempt any FIVE questions out of SEVEN questions.
- Answers to all sub questions should be grouped together.
- Figures to the right indicate full marks.

Master

Q.1 (a) Define a unitary matrix. if $N = \begin{bmatrix} 0 & 1+2i \\ -1+2i & 0 \end{bmatrix}$ is a matrix, then show that $(I-N)(I+N)^{-1}$ is a

6

unitary matrix, where I is an identity matrix

(b) A drug is given to 10 patients and increments in their blood pressure were recorded to be 3, 6, -2, 4, -3, 4, 0, 0, 2, 6. Is it reasonable to believe that the drug has no effect on change of blood pressure?

6

(c) Fit a poisson distribution for the following data and also test the goodness of fit

8

X	0	1	2	3	4	5
f(x)	142	156	69	27	5	1

Q.2 (a) The probability of a man hitting the target is $\frac{1}{4}$. (i) If he fires 7 times what is the probability of his hitting the target atleast twice? (ii) How many times must he fire so that the probability of his hitting the targets atleast once is greater than $\frac{2}{3}$?

6

(b) If $S = \begin{pmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{pmatrix}$ and $A = \frac{1}{2} \begin{bmatrix} 4 & -1 & 1 \\ -2 & 3 & -1 \\ 2 & 1 & 5 \end{bmatrix}$ prove that $SAS^{-1} = \text{diag}(2, 3, 1)$

6

(c) In an examination it is laid down that a student passes if he secures 30% or more marks. He is placed in Ist, IInd or IIIrd division according as he secures 60% or more marks, between 45% & 60% and between 30% & 45% respectively. He gets distinction in case he secures 80% or more marks. It is noticed from the result that 10% of the students failed in the examination where as 5% of them obtained distinction. Calculate the percentage of students placed in the second division

8

Q.3 (a) Find P and Q such that P F Q is in normal form hence find $\rho(F)$

6

SE (Elect), Sem-IV, 27/4/2015,
Applied Mathematics-IV.

$$F = \begin{bmatrix} 2 & 1 & 4 \\ 3 & 2 & 2 \\ 7 & 4 & 10 \\ 1 & 0 & 6 \end{bmatrix}$$

- (b) The number of arrivals of customers during any day follows Poisson distribution with a mean of 6
5 What is the Probability that the total number of customers on two days Selected at random is less than 2?

- (c) For what values of λ and μ the equations

$$x + y + z = 6$$

$$x + 2y + 3z = 10$$

$$x + 2y + \lambda z = \mu$$

Have

- i) No solution
- ii) A unique solution
- iii) Infinite number of solutions

- Q.4 (a) Find the eigen values and the corresponding eigenvectors for the matrix

$$A = \begin{bmatrix} 1 & -6 & -4 \\ 0 & 4 & 2 \\ 0 & -6 & -3 \end{bmatrix}$$

- (b) If X & Y are random variables with the same standard deviation σ and zero correlation then show that $U = X \cos \alpha + Y \sin \alpha$ & $V = X \sin \alpha - Y \cos \alpha$ have zero covariace.

- (c) If $A = \begin{pmatrix} 2 & 3 \\ -3 & -4 \end{pmatrix}$ prove that $A^{100} = \begin{pmatrix} -299 & -300 \\ 300 & 301 \end{pmatrix}$.

- Q.5 (a) If λ is an eigen value of A(non-singular) then prove that $\frac{|A|}{\lambda}$ is an eigen value of adj. A.

- (b) Show that matrix $A = \begin{bmatrix} 7 & 4 & -1 \\ 4 & 7 & -1 \\ -4 & -4 & 4 \end{bmatrix}$ is derogatory

SECELEA), Sem - IV, 27/4/15
Applied Mathematics - IV

(c) In an examination marks obtained by students in mathematics, physics and chemistry are normally distributed with means 51, 53 and 46 with standard deviations 15, 12, 16 respectively. Find the probability of securing total marks (i) 180 or more (ii) 90 or below

6(a) The heights of six randomly chosen sailors are in inches; 63, 65, 68, 69, 71 & 72. The heights of ten randomly chosen soldiers are; 61, 62, 65, 66, 69, 69, 70, 71, 72 & 73. Discuss in the light of this data that the soldiers on an average are as tall as the sailors.

(b) A square matrix A is defined by $A = \begin{bmatrix} -1 & 2 & -2 \\ 1 & 2 & 1 \\ -1 & -1 & 0 \end{bmatrix}$. Find the modal matrix P and the resulting diagonal matrix D of A.

(c) Find the characteristic equation of the symmetric matrix $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ and verify that it is satisfied by A and hence obtain A^{-1} . Express $A^6 - 6A^5 + 9A^4 - 2A^3 - 12A^2 + 23A - 9I$ in linear polynomial in A.

7(a) Seven coins are tossed and number of heads obtained is noted. The experiment is repeated 128 times and following distribution is obtained.

No. of heads	0	1	2	3	4	5	6	7	Total
Frequency	7	6	19	35	30	23	7	1	128

Fit a Binomial distribution if the nature of coins is unknown.

(b) Ten contestants in a beauty contest are judged by three judges in the following order.

Ranks by Ist judge	6	10	2	9	8	1	5	3	4	7
IInd judge	5	4	10	1	9	3	8	7	2	6
IIIrd judge	4	8	2	10	7	5	9	1	3	6

Using rank correlation coefficient find which pair of judges has the nearest

approach to common tastes in beauty

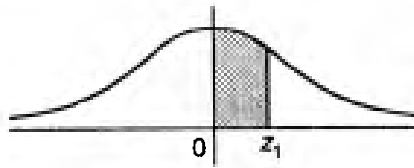
(c) From adult male population of four metros, random samples of sizes given below were taken and

Applied Mathematics - IV
SE (Elect), Sem - IV, ~~Page 4~~; 25/4/2015

the no. of married and single men recorded. Does the data indicate significant variations among the cities in the tendency of men to marry?

City	Delhi	Mumbai	Chennai	Kolkatta	Total
Married	137	164	152	147	600
Single	32	57	56	35	180
Total	169	221	208	182	780

Area Under Standard Normal Curve

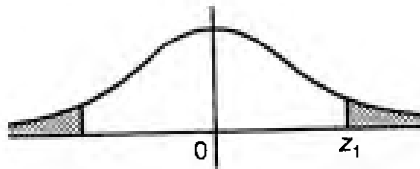


The table gives the area under the standard normal curve from $z = 0$ to $z = z_1$ which is the probability that z will lie between $z = 0$ and $z = z_1$.

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.8832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2703	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4415	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990



Percentage Points of t -distribution



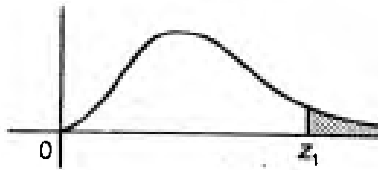
Example

For $\Phi = 10$ d. o. f.

$P(|t| > 1.812) = 0.1$

$\Phi \backslash P$	0.20	0.10	0.05	0.02	0.01
1	3.078	6.314	12.706	31.812	63.657
2	1.886	2.920	4.303	6.965	9.925
3	1.638	2.353	3.182	4.541	5.841
4	1.533	2.132	2.776	3.747	4.604
5	1.476	2.015	2.571	3.365	4.032
6	1.440	1.943	2.447	3.143	3.707
7	1.415	1.895	2.365	2.998	3.499
8	1.397	1.860	2.306	2.896	3.355
9	1.383	1.833	2.262	2.821	3.250
10	1.372	1.812	2.228	2.764	3.169
11	1.363	1.796	2.201	2.718	3.106
12	1.356	1.782	2.179	2.681	3.055
13	1.350	1.771	2.160	2.650	3.012
14	1.345	1.761	2.145	2.624	2.977
15	1.341	1.753	2.131	2.602	2.947
16	1.337	1.746	2.120	2.583	2.921
17	1.333	1.740	2.110	2.567	2.898
18	1.330	1.734	2.101	2.552	2.878
19	1.328	1.729	2.093	2.539	2.861
20	1.325	1.725	2.086	2.528	2.845
21	1.323	1.721	2.080	2.518	2.831
22	1.321	1.717	2.074	2.508	2.819
23	1.319	1.714	2.069	2.500	2.807
24	1.318	1.711	2.064	2.492	2.797
25	1.316	1.708	2.060	2.485	2.287
26	1.315	1.706	2.056	2.479	2.779
27	1.314	1.703	2.052	2.473	2.771
28	1.313	1.701	2.048	2.467	2.763
29	1.311	1.699	2.045	2.462	2.756
30	1.310	1.697	2.042	2.457	2.750
40	1.303	1.684	2.021	2.423	2.704
60	1.296	1.671	2.000	2.390	2.660
120	1.289	1.658	1.980	2.358	2.617
∞	1.282	1.645	1.960	2.325	2.576

Percentage Points of χ^2 - Distribution



Example

For $\Phi = 10$ d. o. f.

$P(\chi^2 > 15.99) = 0.10$

Φ	0 = .99	0.95	0.50	0.10	0.05	0.02	0.01
1	.000157	.00393	.455	2.706	3.841	5.214	6.635
2	.0201	.103	1.386	4.605	5.991	7.824	9.210
3	.115	.352	2.366	6.251	7.815	9.837	11.341
4	.297	.711	3.357	7.779	9.488	11.668	13.277
5	.554	1.145	4.351	9.236	11.070	13.388	15.086
6	.872	1.635	5.348	10.645	12.592	15.033	16.812
7	1.339	2.167	6.346	12.017	14.067	16.622	18.475
8	1.646	2.733	7.344	13.362	15.507	18.168	20.090
9	2.088	3.325	8.343	14.684	16.919	19.679	21.666
10	2.558	3.940	9.340	15.987	18.307	21.161	23.209
11	3.053	4.575	10.341	17.275	19.675	22.618	24.725
12	3.571	5.226	11.340	18.549	21.026	24.054	26.217
13	4.107	5.892	12.340	19.812	22.362	25.472	27.688
14	4.660	6.571	13.339	21.064	23.685	26.873	29.141
15	4.229	7.261	14.339	22.307	24.996	28.259	30.578
16	5.812	7.962	15.338	23.542	26.296	29.633	32.000
17	6.408	8.672	16.338	24.769	27.587	30.995	33.409
18	7.015	9.390	17.338	25.989	28.869	32.346	34.805
19	7.633	10.117	18.338	27.204	30.144	33.687	36.191
20	8.260	10.851	19.337	28.412	31.410	35.020	37.566
21	8.897	11.591	20.337	29.615	32.671	36.349	38.932
22	9.542	12.338	21.337	30.813	33.924	37.659	40.289
23	10.196	13.091	22.337	32.007	35.172	38.968	41.638
24	10.856	13.848	23.337	32.196	36.415	40.270	42.980
25	11.524	14.611	24.337	34.382	37.652	41.566	44.314
26	12.198	15.379	25.336	35.363	38.885	41.856	45.642
27	12.879	16.151	26.336	36.741	40.113	44.140	46.963
28	13.565	16.928	27.336	37.916	41.337	45.419	48.278
29	14.256	17.708	28.336	39.087	42.557	46.693	49.588
30	14.953	18.493	29.336	40.256	43.773	47.962	50.892

100

Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING
(An Autonomous Institute Affiliated to University of Mumbai)

First Half 2015
Duration: 3 Hours

Total Marks: 100

CLASS / SEM: S.Y. B. Tech / Electrical / SEM IV
SUBJECT: ANALOG CIRCUITS

- Question No. 1 is compulsory
- Attempt **any four questions** out of remaining SIX questions.
- Answer to all sub questions should be grouped together.
- Figures to the right indicate **full marks**.

Master

-
- Q.1 A ~ Calculate component values needed for first order Butterworth HPF at cutoff 05
frequency 3 kHz and passband gain of 3. Draw circuit diagram.
- B Explain how IC 7805 can be used to supply a current of 1A to a 10 Ω , 10W load. 05
- C For the circuit of Wein Bridge Oscillator using opamp, the component values used 05
are, $R = 5\text{ K}\Omega$, $C = 1\text{ nF}$, for the feedback network. $R_f = 10\text{ K}\Omega$ and $R_i = 21\text{ K}\Omega$ for
opamp. Draw circuit diagram. Determine whether the circuit will oscillate or not.
If yes, obtain the output frequency.
- D For an astable multivibrator using IC 555, $R_A = 2.5\text{ K}\Omega$, $R_B = 5.9\text{ K}\Omega$, $C = 05$
 $0.01\mu\text{F}$. Calculate T_{HIGH} , T_{LOW} , Frequency. 10
- Q.2 A Explain classification of Power Amplifiers. 10
- B Explain the need of heat sink for power amplifiers? What is P_{dmax} rating? 10
- Q.3 A Discuss the reasons for difference in frequency response of BJT amplifier and 10
opamp. Elaborate with suitable diagrams.

SECElect), Sem - IV, Re-Exam, 17/6/15
Analog Circuits

- B Draw a neat circuit diagram of RC phase shift oscillator using BJT. Explain the working. What is the frequency of oscillations?
- Q.4 A Design a voltage regulator to give regulated output voltage of 05 V using IC 723
- B 7805 can be used as to give regulated output voltage of 7 V. State whether this is true or false. Justify. 10
- Q.5 How the 555 is used as
- A Schmitt Trigger 10
- B Monostable multivibrator 10
- Q.6 A What are the advantages of negative feedback? 08
- B With the help of suitable block diagram explain the different types of negative feedback. For each type give feedback factor, input resistance, output resistance. 12
- Q.7 A How filters are classified based on frequency response? 10
- B With respect to frequency response of a filter, explain the terms: pass band gain, stop band gain, cutoff frequency and bandwidth of a filter. 10

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02.05.15.

S.E. Electrical / Sem IV
Analog Circuits

Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING
(An Autonomous Institute Affiliated to University of Mumbai)

Total Marks: 100

First Half 2015
Duration: 3 Hours

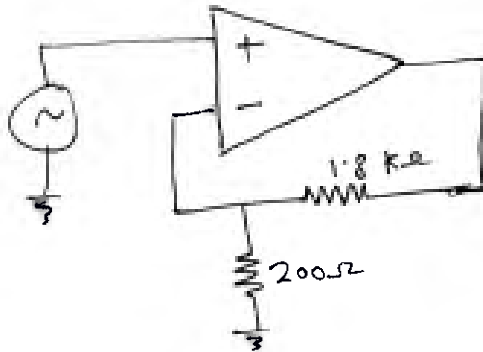
CLASS / SEM: S.E. Electrical / SEM IV
SUBJECT: ANALOG CIRCUITS

- Question No. 1 is compulsory
- Attempt **any Four** questions out of remaining **SIX** questions.
- Answer to all sub questions should be grouped together.
- Figures to the right indicate **full marks**.

MASTER FILE.

Q.1	State whether following statements are True/False. Justify your answer.	20
	(i) Current series type negative feedback increases input impedance.	
	(ii) Active filters are preferred over passive filters.	
	(iii) Heat sink is employed with power amplifier.	
	(iv) Output current of 7805 can be boosted.	
Q.2	A Design a voltage regulator to give regulated output voltage of 15 V using IC 723	10
	B What is current fold back ? Explain with neat diagrams.	10
Q.3	A What are Barkhausen's criteria? How oscillator produces output without any input applied to it?	05
	B How oscillators are classified based on the components used in the feedback network? What is the frequency range for each type?	05
	C Draw a neat circuit diagram of RC phase shift oscillator using FET. State expression for frequency. Explain the role of feedback network.	05
	D Design first order LPF with cutoff frequency 5kHz and a pass band gain of 10.	05
Q.4	How the 555 is used for	
	A Pulse width modulation	10
	B To obtain square wave with duty cycle of 40 %	10

- Q.5 A Determine voltage gain, input impedance, output impedance with feedback for voltage series feedback. Following data is given: $A = -100$, $R_i = 10\text{k}\Omega$, $R_o = 20\text{k}\Omega$, $\beta = -0.1$. Comment on the result. 08
- B For amplifier having bandwidth of 30KHz and gain $A_v = 50$, calculate the effect of 1% negative feedback. 06
- C Refer to the figure shown below. Identify the type of feedback. Calculate A_f with $A =$ (i) 10^5 (ii) 10^3 (iii) 10 Comment on the result. 06



- Q.6 A A transformer coupled class A power amplifier is to be designed with following specifications. Output ac power 25 watts, load resistance 4Ω , D.C. supply voltage 24V. Efficiency of the transformer is 80%, $S_{ICO} \leq 8$. Two transistors available are 10
- 2N3055 [$P_{Dmax} = 115.5\text{W}$, $I_{Cmax} = 15\text{A}$, $V_{CE0} = 60\text{V}$]
- ECN149 [$P_{Omax} = 30\text{W}$, $I_{Cmax} = 4\text{A}$, $V_{CE0} = 40\text{V}$]
- Select the appropriate transistor on the basis of P_{Dmax} .
 Check whether V_{CC} value is adequate.
- B With neat circuit diagram explain complementary symmetry class B push pull amplifier, what is the need of Class AB amplifier? 10
- Q.7 A Compare frequency responses of BJT and opamp at lower frequencies. Explain the difference if any. 05
- B What is the application of Miller's theorem? 05
- C What is meant by linear regulator/ what is meant by switching regulator? 05
- D Explain working principal of crystal oscillator. 05

Andheri (west), Mumbai -58
END SEMESTER EXAM - April 2015

Total Marks: 50

Subject: Presentation & Communication Techniques

Duration: 2 hrs

Class: IV Semester Electrical, Mechanical, Civil (SE) (CIMIE)

Date: Master

Instruction: All Questions are compulsory.

Q.1. Fill in the blanks. (2marks)

- i) _____ represents the unofficial channels of communication which are created and controlled by people themselves rather than the management.
- ii) _____ communication is used to explain to the subordinates the rationale of their jobs so that they understand the significance of their work in relation to organizational goals.
- iii) _____ is a formal gathering of persons for the purpose of discussing and deciding matters of common interests of all of them.
- iv) The official records of the proceedings of a meeting is known as the _____.

Q.2. Prepare a minute of narration based on the following notice and agenda for a meeting. (8 marks)

NOTICE

25 April 2015

It is hereby informed that the fifth meeting of Board of Directors of the ABC Company will take place in the Board Room, Corporate Mansion, on 28 April 2015, at 10.00 am.

Following are the agendas for meeting:

1. Confirmation of minute of previous meeting
2. Consideration of Report of the expert Committee for proposed setting up of a new plant
3. Consideration of issue of new employee health benefits
4. Consideration of the proposal for new employee training program
5. Any other matter with the permission of the Chairman
5. Date of next meeting

S.K. Arora
Secretary

Q.3. You are an employee of sales department of Tesco International Pvt. Ltd. From past few months employees in the department have been suffering from physical and mental health issues. An effect of which is visible in the productivity and efficiency of the department. Your boss, the Sales Manager has asked you to look into the matter, and submit an analytical report based on your investigation and observation, with recommendations for physical as well as mental health issues. Write in memo report format. (10 marks)

Q.3. Discuss any one behavioral theory of leadership in detail. (5marks)

Q.4. Discuss any five disadvantages of group decision making in brief. (5 marks)

Q.5. List any 10 tips for making effective Powerpoint Presentation. (5 marks)

Q.6. What is 80:20 rule of time management and how to you develop 80:20 thinking. (7 marks)

Q.7. State whether following is true or false. Give reasons to your answer. (8 marks)

- i) Your communication will be very effective if you use impressive vocabulary and correct grammar.
- ii) The message sent is not always the same as the message received.
- iii) A successful leadership does not depend on appropriate behavior, skills, actions and personal traits. Because leaders are born and not made.
- iv) In a group, more the number, more knowledge and information can flow in.

100

**BHARTIYA VIDYA BHAVAN'S
SARDAR PATEL COLLEGE OF ENGINEERING**

[An Autonomous Institution Affiliated to University of Mumbai]

SUBJECT: Presentation and Communication Techniques (2014-2015)

Total Marks: 50

CLASS/SEM: IV (Elect) SE Duration: 2 Hour

- 1) All Questions are compulsory.
- 2) Figures to the right indicate marks.

Master

Q.1. A company is considering a proposal to establish a new factory in your town. The managing Director has asked you to write a report on the suitability of the place for the establishment of this factory. For this report, an outline is provided below. Study it carefully and rewrite it in accordance with the principles of coordination, subordination, phrasing, numbering, ordering, etc. Write the Complete report in letter form.

-10-

Establishment of a New Factory

Outline

1. Introduction
2. Fire fighting and Communication facilities
 - i. Telephone
 - ii. Fax
 - iii. Films
 - iv. Games
3. Education and Entertainment facilities
4. How is the market
 - a. Potential
 - b. General
5. Labor from Local and other Plants
 - 5.1 Raw Materials
 - 5.2 Cost
6. Transport Facilities
 - 6.1 Rail, Road, Air
 - 6.2 Raw Materials
 - a. Building
 - b. Infrastructural
7. Recommendations
8. Conclusions

Q.2.A. What factors will you bear in mind while giving an oral presentation before a large group? Write 15 most important steps.

-05-

Q.2.B. Define Leadership and explain the functions of a leader.

-05-

Q.3.A. List ten top Time-wasters. List five effective time management tips.

-05-

Q.3. B. What is Group dynamics? Explain 5 characteristics of an effective group .

-05-

Q.4.A. As an effective Manager what strategies will you adopt to conduct an effective meeting. -05-

Q.4. B. Read the case below and answer the questions:- -10-

Dr. Ahmed Khan was the public management department chair person for ten years at Hindu University. His leadership style was explained as "autocratic". However, he had, "personal qualities necessary to command respect and loyalty". Additionally, Dr. Ahmed Khan made and enforced all rules, regulations and policies in extreme detail. His autocratic style of leadership left very little to the individual faculty member in terms of experimentation, freedom in teaching and handling of students. His style of leadership caused the faculty to be "passive, subservient, dependent and ambivalent". However, faculty morale was generally high and faculty turnover was modest. Many faculty members trusted Dr. Ahmed Khan and felt that they were not restricted.

When Dr. Ahmed Khan suddenly died he was replaced by Dr. R. R. Rangaswamy case study holds that Dr. Rangaswamy came from a neighbouring university where he held a position as a faculty member and assistant department chairperson. Dr. Rangaswamy's leadership style was in sharp contrast to Dr. Ahmed Khan. Dr. Rangaswamy believed strongly in the concept of "democratic administration". In other words, he believed in delegating tasks to his subordinates. For example, at the first department meeting of the semester, he articulated that he wanted to share the budgeting, scheduling and the allocation of supplies responsibilities with the members of the faculty. He believed that this would allow the faculty to have a greater role in the decision making process. Unfortunately, this led to decreased morale and a feeling that Dr. Rangaswamy was assigning chair person work to faculty members.

Furthermore, Dr. Rangaswamy did not assign the faculty any non-instructional duties, assuming that the faculty would participate in committee and department meetings, advice student groups with no interference from him. However, this did not happen and was eventually noticed by the dean, and Dr. Rangaswamy was invited for a "chat". During this "chat" the dean and the provost stated that they "no longer know what's going on in the 'public Management Department' and were concerned that perhaps Dr. Rangaswamy was not up to the job of department chair".

- Explain the leadership traits of both Dr. Ahmed Khan and Dr. Rangaswamy? -04-
- How a change in leadership has caused a successful Public Management Department to be deemed unsatisfactory by the Dean? And why? -04-
- Write recommendations as Dean to improve the situation. -02-

Q.5. Fill in the blanks:- -05-

- The informal channel of communication is also called _____.
- _____ is the Redressal forum in an organization.
- _____ for a meeting should be circulated in advance.
- A presentation with _____ distracts the audience than captures the attention of an audience.
- The capacity for recognizing our own feelings and those of others for motivating and for managing emotions is called as _____.
- _____ types of reports analyze problems and present a conclusion and also give recommendations.