

FACULTY OF ENGINEERING
B.E. IV - Semester (CME) (Main) Examination, October 2021

Subject: Effective Technical Communication in English

Time: 2 Hours

Max. Marks: 70

(Missing data, if any, may suitably assumed)

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

- 1 What do you mean by Jargon? Give example.
- 2 What is ABC of Technical Communication?
- 3 What is a memo and why is it used?
- 4 Why is communication through E-mail, a preferred tool today?
- 5 What are the three main formats of business letter writing?
- 6 Write any two benefits of a progress report.
- 7 What do you mean by appendices in a report?
- 8 (i) _____ manual can be used to train new hires in a company.
(ii) Instruction manual is another name for _____ manual.
- 9 Discuss the importance of visuals in a presentation.
- 10 Mention at least two strategies to prepare effective slides for power point presentation.

PART – B

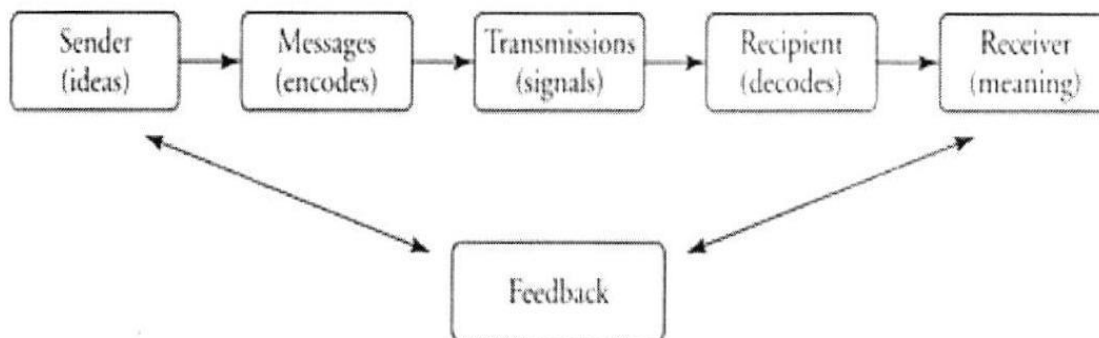
Note: Answer any four questions.

(4x15 = 60 Marks)

- 11 (a) Define technical communication. Discuss the factors that differentiate it from general writing.
(b) In technical communication one requires subject competence, linguistic competence and skillful organizing of information. Write a note on these three essentials.
- 12 (a) What is an IOM? Write a note on the various purpose of drafting an IOM.
(b) For your upcoming GATE examination, you are interested to join an online coaching offered by "Made Easy", a Delhi based institute that prepares students for competitive exams. However, you find the information on their official website inadequate. Draft an enquiry letter regarding the joining of the classes at the earliest. You can enquire about the following things:
(Process of joining, Payment in installment, Duration of course, functioning of the classes. Study materials, Mock examination etc.)
- 13 (a) What is a feasibility report? Discuss the purposes of preparing a feasibility report.
(b) Indian Airways has been constantly incurring losses due to a sharp decline in the number of passengers. The Civil Aviation Department, Govt. of India wants to know the real causes for the passengers' lack of interest in this airways. You being the Chief Commercial manager have been asked to submit a report identifying the loopholes and recommend suitable measures.
- 14 (a) What is a product manual? Identify the key elements of a product manual.
(b) Compose an operations manual of a reputed restaurant in Hyderabad. The following points may be considered: hierarchy of staff, roles of staff, employee training, service procedure, food quality, safety and hygiene etc.

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- 15 (a) Write brief notes on nonverbal communication.
 (b) Write a meaningful paragraph based on the information given below.



- 16 (a) Discuss the important guidelines to be considered while composing an E-mail.
 (b) What are the significant differences between verbal and nonverbal communication?
- 17 (a) Discuss the role of pronunciation, tone, volume and pace in making an oral presentation effective.
 (b) Read the following paragraph and prepare a chart/diagram highlighting the important ideas in it.

Types of Diseases

Diseases are broadly classified into two types viz. communicable diseases and non-communicable or lifestyle diseases. Communicable diseases spread through various mediums of infection. This includes air (e.g. influenza), food (e.g. dysentery) and water (e.g. typhoid). On the other hand, the major causes of non-communicable or lifestyle diseases are either faulty eating habits or faulty living habits. Faulty eating habits generally result in diseases like diabetes and obesity, while faulty living habits are associated with stress and hypertension. Public awareness regarding different types of infection and their causes is essential to prevent and control the spread of diseases in society.

FACULTY OF ENGINEERING

B.E. IV - Semester (CE/EE/EIE/CSE) (AICTE)(Main &BL) Examination, October 2021

Subject: Effective Technical Communication in English

Time: 2 Hours

Max. Marks: 70

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

- 1 Outline the process of communication with the help of a flow chart.
- 2 List some barriers to communication, suggest measures to overcome them.
- 3 What are the formal channels of communication in an organization?
- 4 List the uses of visual aids in Technical writing.
- 5 What are solicited letters? Give two examples.
- 6 What is the function of an abstract in a Report?
- 7 What is a Feasibility report?
- 8 What is the significance of RFQ in a Business Proposal?
- 9 What is an Operations Manual?
- 10 How do graphic organisers aid in oral presentations?

PART – B

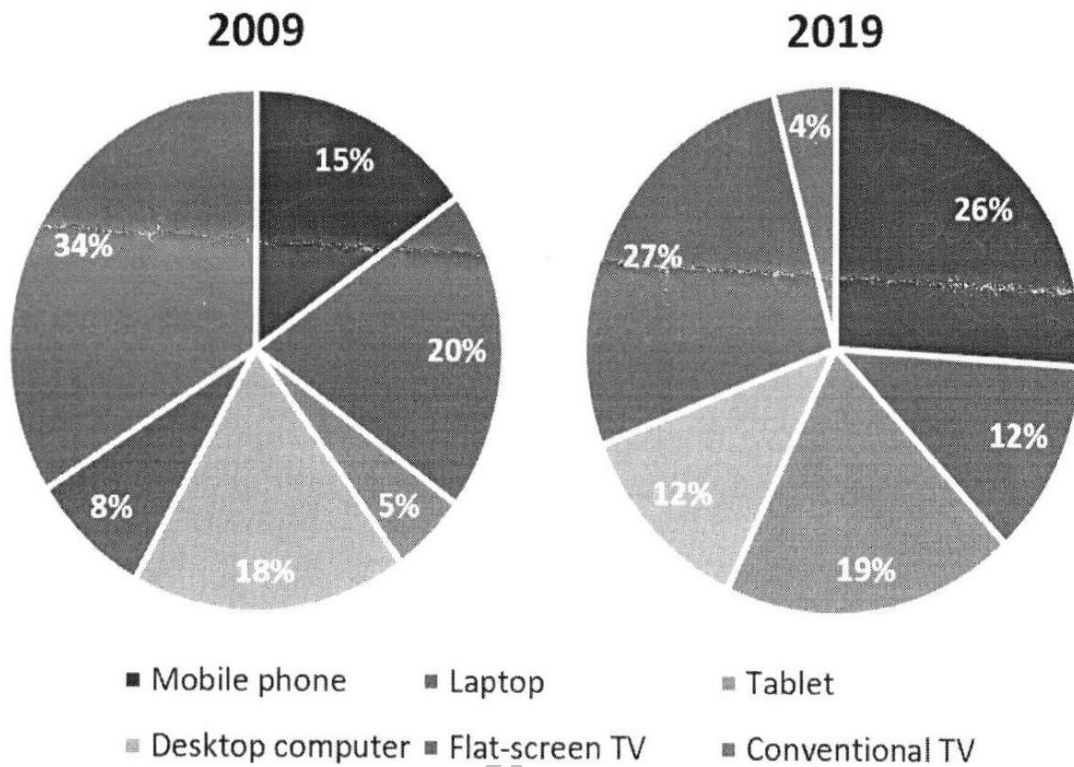
Note: Answer any four questions.

(4x15 = 60 Marks)

- 11 (a) Explain how general writing differs from Technical Writing.
(b) Differentiate between downward and upward communication flows in an organization.
- 12 (a) Write an email in about 100 words to the manufacturer, Mr.Rahul, explaining the defect in the goods you purchased.
Use the following hints: received the goods ordered – schedule – 10th Feb (Monday) – damaged goods – 7 days overall delay – needed urgent replacement.
(b) Mention some of the do's and don'ts (etiquette) of email writing.
- 13 (a) Explain the structure of a Manual.
(b) Write a set of instructions to any electrical device you use at home.
- 14 (a) Outline the essential features of a report.
(b) Write a feasibility report on having an auditorium in your college campus.
- 15 (a) Write a note on the various purposes for which a Sales letter is written. Provide at least two catch phrases for the introduction segment of a Sales letter.
(b) Draft a technical proposal to the CEO of BEST company for the purchase and installation of the equipment. Invent all the necessary details.
- 16 (a) Write a memo to the staff of accounts department in your organisation, asking them to attend a training programme to learn about the new software that the company has launched.
(b) Elaborate on the different segments of a Memo.

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17 "The use of Visual aids is essential to all Presentations". Explain the pie charts below show the devices people in the 18 to 25 age group use to watch television in India in two different years. Summarise the information by describing the main features, and make comparisons where relevant in 200 words.



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FACULTY OF ENGINEERING
B.E. IV - Semester (ECE) (AICTE) (Main) Examination, October 2021

Subject: Human Values & Professional Ethics

Time: 2 Hours

Max. Marks: 70

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

- 1 What are the five human values?
- 2 Discuss 'physical facilities' as the basic requirement of fulfilling human aspirations.
- 3 Interpret in your words about self and body.
- 4 How does interconnectedness help in understanding harmony?
- 5 Give an appraisal of physical needs.
- 6 How do trust and respect enhance the value of human relationship?
- 7 Mention the salient values in relationship.
- 8 What is recyclability in human values?
- 9 Explain natural acceptance in terms of human values.
- 10 Write about humanistic education.

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

- 11 What are the basic human aspirations for continuous happiness and prosperity?
- 12 Define 'Sanyam' and 'Swasthya'. How are the two related?
- 13 Explain the mechanism for self-exploration in terms of Natural Acceptance and Experiential Validation.
- 14 Differentiate between intension and competence.
- 15 Discuss "Understanding the body as an instrument of 'I'".
- 16 "Whole existence as Co-Existence" Elucidate it in terms of understanding the harmony.
- 17 What is ethical human conduct? How can it be basis for humanistic education?

FACULTY OF ENGINEERING

B.E. IV - Semester (AICTE) (ECE/MP/AE/I.T) (Main & Backlog) Examination, October 2021

Subject: Biology for Engineers

Time: 2 Hours

Max. Marks: 70

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

- 1 Write a short note on Cell theory.
- 2 Briefly describe about enzymes.
- 3 Write about control of microorganisms.
- 4 Define excretion.
- 5 What is the significance of mitosis?
- 6 Describe briefly about central dogma.
- 7 Write a brief note on cancer.
- 8 Describe about antigen-antibody immune response.
- 9 What are bio fertilizers?
- 10 Describe briefly about biopharming.

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

- 11 Describe in detail the characteristics of living organisms. Add a note on basic classification of living organisms.
- 12 Explain in detail the classification and functions of carbohydrates.
- 13 Describe in detail the digestive system in animals and its functions.
- 14 Discuss about the basic concepts of plant growth and nutrition.
- 15 Describe Mendel's laws of inheritance.
- 16 What are the causes, symptoms, diagnosis, treatment and prevention of Hepatitis?
- 17 Explain in detail about stem cell and tissue engineering.

FACULTY OF ENGINEERING**B.E. IV - Semester (CBCS) (Civil)(Backlog) Examination, October 2021****Subject: Numerical Methods****Time: 2 Hours****Max. Marks: 70****(Missing data, if any, may be suitably assumed)****PART – A****Note: Answer any five questions.****(5x2 = 10 Marks)**

- 1 Define algebraic and transcendental equations.
- 2 Perform the first two approximations of bisection method to solve $x^2 - 5 = 0$.
- 3 Find the Lagrange's interpolation polynomial for the data given below:

x	0	-1	1
$f(x)$	1	2	3

- 4 State Newton's forward and backward differences interpolation formulae.
- 5 Write the expression for finding $\frac{d^2y}{dx^2}$ using Newton's forward interpolation.
- 6 Evaluate $\int_1^2 x^3 dx$ using Simpson's 1/3 rule with $h=0.25$.
- 7 Solve numerically $y' = y + e^x$, $y(0) = 0$ for $x = 0.1$ by Euler's method.
- 8 Write Milne's predictor-corrector formulae.
- 9 Classify $u_{xx} + 2u_{xy} + 4u_{yy} = 0$.
- 10 Find the finite difference approximation for $\frac{\partial^2 u}{\partial x^2}$.

PART – B**Note: Answer any four questions.****(4x15 = 60 Marks)**

- 11 Solve the system of equations $8x + y + z = 8$, $2x + 4y + z = 4$, $x + 3y + 5z = 5$ using Gauss-Seidel iterative method.

- 12 Find all the eigen values and the corresponding eigen vectors of the matrix $A = \begin{pmatrix} 1 & \sqrt{2} & 2 \\ \sqrt{2} & 3 & \sqrt{2} \\ 2 & \sqrt{2} & 1 \end{pmatrix}$

by Jacobi method.

- 13 Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 4.0$ from the following data:

$x :$	1.5	2.0	2.5	3.0	3.5	4.0
$y :$	3.375	7.0	13.625	24.0	38.875	59.0

..2..

14 Use Picard's method to find an approximate value of y for $x=0.1, x=0.2$ if $\frac{dy}{dx} = x + y, y(0)=1$.

15 Using Crank-Nicholson scheme, solve $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$ subject to the conditions $u(x,0)=0, u(0,t)=0$, and $u(1,t)=t$. Compute u for two steps in t direction taking $h=1/4$.

16 (a) Apply Newton-Raphson method to find the root of $e^x = 3x$ that lies between 0 and 1.
 (b) Solve $3x + y + 2z = 3, 2x - 3y - z = 3, x + 2y + z = 4$ using Gauss elimination method.

17 (a) Evaluate $\int_1^{1.5} \int_1^2 \frac{dx dy}{x+y}$ using Simpson's 1/3 rule with $h=0.5$ and $k=0.25$.

(b) Using Newton's divided difference interpolation, find $f(9)$ from the following data:

$x:$	5	7	11	13	17
$f(x):$	150	392	1452	2366	5202

FACULTY OF ENGINEERING**B.E. IV - Semester (EEE/Inst/M/P/AE) (CBCS) (Backlog) Examination, October 2021****Subject: Engineering Mathematics - IV****Time: 2 Hours****Max. Marks: 70****(Missing data, if any, may be suitably assumed)****PART – A****Note: Answer any five questions.****(5x2 = 10 Marks)**

- 1 Find the Fourier sine transform of $f(x) = e^{-x}$.
- 2 If $F\{f(x)\} = F(s)$, prove that $F\{f(x-a)\} = e^{isa} F(s)$.
- 3 Find $Z\left\{\frac{1}{n!}\right\}$.
- 4 State final value theorem of Z transforms.
- 5 Perform the first two approximations of bisection method to solve $x^3 - 2x + 1 = 0$.
- 6 Find the second divided difference of $f(x) = \frac{1}{x}$ using the points a, b and c.
- 7 Write the normal equations for fitting a parabola of the form $y = a + bx + cx^2$.
- 8 The two regression lines are $x = -0.4y + 6.4$ and $y = -0.6x + 4.6$. Find the mean values of x and y .
- 9 Find the mean of exponential distribution.
- 10 State Baye's theorem.

PART – B**Note: Answer any four questions.****(4x15 = 60 Marks)**

- 11 Find the Fourier transform of $f(x) = \begin{cases} 1-x^2, & |x| \leq 1 \\ 0, & |x| > 1 \end{cases}$. Hence show that

$$\int_0^{\infty} \frac{x \cos x - \sin x}{x^3} \cos\left(\frac{x}{2}\right) dx = \frac{-3\pi}{16}.$$

- 12 Solve the difference equation $y_{n+2} + 5y_{n+1} + 4y_n = 2^n$, $y_0 = 1$, $y_1 = -4$ using Z transforms.
- 13 Using Runge-Kutta method of order 4, find the approximate values of $y(1.1)$ and $y(1.2)$ for the initial value problem $\frac{dy}{dx} = x^2 + y^2$, $y(1) = 2$.
- 14 From the following data, find the rank correlation coefficient.

x:	68	64	75	50	64	80	75	40	55	64
y:	62	58	68	45	81	60	68	48	50	70

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15 Two random samples of sizes 9 and 6 gave the following values of the variable.

Sample I	15	22	28	26	18	17	29	21	24
Sample II	8	12	9	16	15	10	-	-	-

Test the difference of the estimates of the population variances at 5% level of significance.

16 (a) Using convolution theorem, find $Z^{-1}\left\{\frac{z^2}{(z-1)(z-2)}\right\}$.

(b) Solve $x+2y+3z=1, 2x+3y+8z=2, x+y+z=3$ using Gauss elimination method.

17 (a) If θ is the angle between two regression lines, show that $\tan \theta = \frac{1-r^2}{r} \frac{\sigma_x \sigma_y}{\sigma_x^2 + \sigma_y^2}$.

(b) If X is a normal variate with mean 30 and standard deviation 5, find the probability that $|X - 30| > 5$.

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FACULTY OF ENGINEERING
B.E. IV - Semester (CBCS) (ECE) (Backlog) Examination, October 2021

Subject: Applied Mathematics

Time: 2 Hours

Max. Marks: 70

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

- 1 Define subspace of a vector space.
- 2 Write (1,2) as a linear combination of (1,1) and (0,1).
- 3 Explain bisection method for solving $f(x)=0$.
- 4 Construct divided difference table for the following data:

$x:$	1	2	4
$f(x):$	1	7	61

- 5 Write the expression for finding $\frac{dy}{dx}$ using Newton's forward difference interpolation.
- 6 Find the first approximation to the solution of $y' = x + y$, $y(0)=1$ using Picard's method.
- 7 Define correlation and state types of correlation.
- 8 Find the mean values of x and y , if the two lines of regression are
 $2y - x - 50 = 0$, $2y - 2x - 10 = 0$.
- 9 Define a linear programming problem.
- 10 Define a feasible solution and an optimal solution of a linear programming problem.

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

- 11 (a) Let V be the set of all ordered pairs (x, y) , where x and y are real numbers. Define addition and scalar multiplication in V as $(x_1, y_1) + (x_2, y_2) = (x_1x_2, y_1y_2)$ and respectively, where $(x_1, y_1), (x_2, y_2)$ are elements in V and α is a scalar. Show that V is not a vector space.
- (b) If a transformation $T: R^2 \rightarrow R$ is defined by $T\begin{pmatrix} x \\ y \end{pmatrix} = x + 3y$, find the rank and nullity of the transformation.
- 12 (a) Find a real root of the equation $x^3 - 3x - 5 = 0$ correct to two decimal places using Newton-Raphson method.
- (b) Solve the system of equations $3x + y + 2z = 3$, $2x - 3y - z = -3$, $x + 2y + z = 4$ by Gauss elimination method.
- 13 Apply Runge-Kutta method of order 4 to find an approximate value of $y(1.2)$ in steps of 0.1, for $y' = x^2 + y^2$, $y(1) = 1.5$.

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14 Fit a linear curve of the form $y = a + bx$ and a second degree polynomial of the form

$y = a + bx + cx^2$ for the following data:

$x:$	-1	0	1	2	3
$y:$	0	1	2	9	28

15 Use simplex method to maximize $z = x_1 + 2x_2 + 3x_3$ subject to the constraints

$x_1 + 2x_2 + 3x_3 \leq 10$, $x_1 + x_2 \leq 5$, $x_1, x_2, x_3 \geq 0$.

16 Find $f(0.2)$ and $f(1.2)$ using Newton's forward and backward formulae respectively, for the following data:

$x:$	0.1	0.3	0.5	0.7	0.9	1.1	1.3
$f(x):$	0.003	0.067	0.148	0.248	0.370	0.518	0.697

17 (a) Find the interpolation polynomial for the following data:

$x:$	0	-1	1
$f(x):$	1	2	3

(b) Find the rank correlation coefficient from the following data:

$x:$	85	60	73	40	90
$y:$	93	75	65	50	80

FACULTY OF ENGINEERING

B.E. IV - Semester (CSE) (CBCS) (Backlog) Examination, October 2021

Subject: Mathematics and Statistics

Time: 2 Hours

Max. Marks: 70

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

- 1 Find the Laplace transform of $f(t) = \cosh 2t$.
- 2 Find $L^{-1}\left\{\frac{1}{s^2 + 2s + 1}\right\}$.
- 3 Find the Fourier transform of $f(x) = \begin{cases} 1, & |x| < 1 \\ 0, & |x| > 1 \end{cases}$.
- 4 State convolution theorem for Fourier transforms.
- 5 Convert $(1999)_{10}$ from decimal to base 7 notation.
- 6 If $a=57$, $b=4$ find the integers q and r such that $a=bq+r$, $0 \leq r < b$.
- 7 A random variable X is normally distributed with mean 9 and standard deviation 3. Find $P(X \geq 15)$.
- 8 State Baye's theorem.
- 9 Show that the correlation coefficient is the geometric mean of regression coefficients.
- 10 The two regression lines are $x = -0.4y + 6.4$ and $y = -0.6x + 4.6$. Find r .

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

- 11 Solve the initial value problem $y'' + 5y' + 5y = e^{-t} \sin t$, $y(0) = 0$, $y'(0) = 1$ using Laplace transforms.
- 12 Find the Fourier sine transform of $f(x) = e^{-|x|}$. Hence show that $\int_0^{\infty} \frac{x \sin mx}{1+x^2} dx = \frac{\pi e^{-m}}{2}$, $m > 0$.
- 13 (a) If $\gcd(a, b) = 1$, prove that $\gcd(a+b, a-b) = 1$ or 2 .
(b) Solve the linear congruence $25x \equiv 15 \pmod{29}$.
- 14 Two random samples of sizes 9 and 6 gave the following values of the variable.

Sample I	15	22	28	26	18	17	29	21	24
Sample II	8	12	9	16	15	10	-	-	-

 Test the difference of estimates of the population at 5% level of significance.

- 15 Find the correlation coefficient between x and y from the following data:

$x:$	1	2	3	4	5	6	7	8	9	10
$y:$	10	12	16	28	25	36	41	49	40	50

Also find the two regression lines.

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16 (a) Find the Laplace transform of $f(t) = \frac{\sin t}{t}$.

(b) Find the finite Fourier cosine transform of $f(x) = 2x$, $0 < x < 4$.

17 (a) If X is uniformly distributed over $(-k, k)$, then find k so that $P(X > 1) = \frac{1}{3}$.

(b) Fit the least square curve $y = ax^b$ to the following data:

$x:$	1	2	3	4	5
$y:$	0.5	2	4.5	8	12.5

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FACULTY OF ENGINEERING
B.E. IV - Semester (CBCS) (IT) (Backlog) Examination, October 2021

Subject: Signals & Systems

Time: 2 Hours

Max. Marks: 70

Note: Missing data, if any may be suitably assumed.

PART – A

Answer any five questions.

(5x2 = 10 Marks)

- 1 Define Signal and System.
- 2 Find the even and odd components of the signal $x(t)=\sin(t)+\cos(t)\sin(t)$.
- 3 What are Dirichlet's conditions for the existence of Fourier transform?
- 4 Explain Fourier Spectrum.
- 5 How are the impulse response and step response of an LTI system related?
- 6 Find the Fourier transform of $e^{-at}u(t)$.
- 7 Give classification of discrete time signals.
- 8 When aliasing does occur? How it can be avoided?
- 9 Distinguish between DTFT and Z transform.
- 10 State initial value theorem and final value theorem in Z-Transform.

PART – B

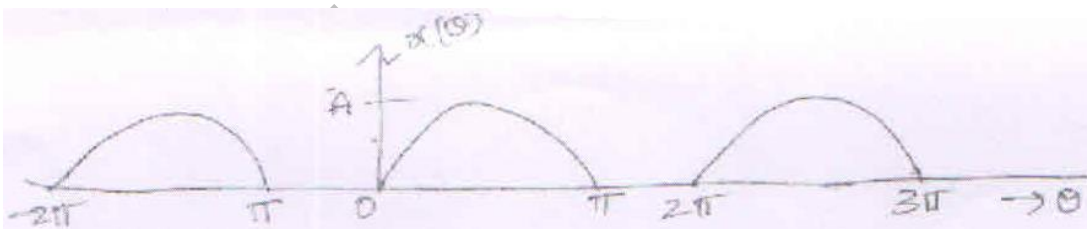
Answer any four questions.

(4x15 = 60 Marks)

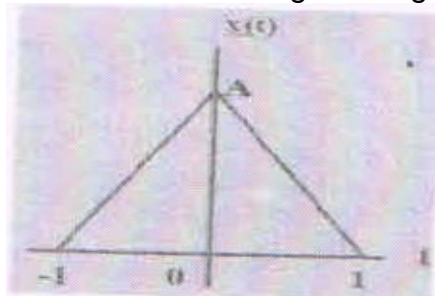
- 11 (a) Check $y(t)=at^2x(t)+btx(t-4)$ is static or dynamic, linear or Non-linear, causal or Non-causal and Time variant or Time Invariant.
- (b) Find whether the signal is energy or power signal

$$X(t) = \begin{cases} t-2, & \text{for } -2 \leq t \leq 0 \\ 2-t, & \text{for } 0 \leq t \leq 2 \\ 0, & \text{otherwise} \end{cases}$$

- 12 Obtain the exponential Fourier series for the waveform shown in figure below



- 13 (a) Find the Fourier transform of triangular signal shown below



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(b) State and Prove Time shifting property and Frequency shifting property of Laplace Transform.

14 (a) State and explain sampling theorem for band limited signals.

(b) Find Nyquist rate and Nyquist interval for the signal $x(t) = \sin(100\pi t) + 2\sin(50\pi t)$

15 (a) Find the Z-Transform and ROC of $X(z)$ for

$$X(n) = \left(\frac{1}{4}\right)^n \cos\left(\frac{\pi}{3}n\right)u(n).$$

(b) Explain Properties of DTFT.

16 (a) What are the basic operations on signals? Illustrate with example.

(b) Derive the expression for Fourier Transform from Fourier series.

17 (a) Compare Laplace transform and Z-Transform.

(b) Comparison of continuous time signal analysis with discrete time signal analysis.

FACULTY OF ENGINEERING

BE 2/4 II-Semester (Civil/ECE/AE/CSE) (Backlog) Examination, October 2021

Subject: Environmental Studies

Time: 2 Hours

Max marks: 75

Missing data, if any, may be suitably assumed

PART - A

Note: Answer any seven questions.

(7x3=21 Marks)

1. Differentiate between the concepts of food chain, food web and trophic levels
2. What is Biomagnification?
3. How can an individual conserve different natural resources?
4. Explain the causes and effects of land degradation
5. What is meant by primary and secondary air pollutants
6. What are the effects of noise pollution?
7. List the objectives of rain water harvesting
8. Explain the importance of protecting the environmental side by side with industrial development.
9. What does Environmental (protection) Act 1986 of India mean? List the major categories of pollutant.
10. How is life style related to our growing municipal solid waste problem?

PART - B

Note: Answer any three questions.

(3x18=54 Marks)

11. Write notes on
(a) Hydrological Cycle, (b) Carbon cycle and (c) Nitrogen cycle
12. Why should we care about wildlife? Explain reasons for loss of biodiversity
13. Differentiate between renewable and non-renewable resources. Explain the merits and demerits of Bio-energy.
14. Why does the construction of big dams often face opposition from the public? Justify your answer giving examples.
15. What is water pollution? Briefly discuss causes, effects and control measures of water pollution.
16. a) Write the salient features of Wild Life Protection Act, state its limitations / drawbacks.
b) Explain the role of Engineer in environmental sustainability
17. a) Discuss the role of rainwater harvesty in water remove management
b) Name and briefly discuss the three functional elements of solid waste management and explain why recycling is an integral part of solid waste management.

FACULTY OF ENGINEERING

B.E. 2/4 II - Semester (EEE) (Backlog) Examination, October 2021

Subject: Power System – I

Time: 2 Hours

Max. Marks: 75

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any seven questions.

(7x3 = 21 Marks)

- 1 What are advantages of hydel power station?
- 2 What are advantages of Non conventional energy sources over conventional energy sources?
- 3 What is solar radiation?
- 4 What are advantages and disadvantages of solar tidal power?
- 5 What is two part tariff? Write the different types of tariff.
- 6 Define base load and peak load.
- 7 List the various part of cables.
- 8 What is mechanical sag of transmission line? What are disadvantages of having too low or too high sag?
- 9 What is self GMD and Mutual GMD?
- 10 What are bundle conductors? What is the significance of using them?

PART – B

Note: Answer any three questions.

(3x18 = 54 Marks)

- 11 (a) What are the various criteria for selection of nuclear power plant?
(b) List the various types of steam turbine and give their uses.
- 12 (a) Discuss about necessity of superheated steam, pulverized coal and preheated air in thermal power plant.
(b) With help of neat sketch describe the working of a pressurized water reactor used in a nuclear power plant.
- 13 (a) What is the function of solar concentrators? Describe various components of a solar concentrator and discuss its advantages.
(b) Explain with neat sketches, the principle of Geothermal power plant.

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14 (a) compare 3 wire distribution system with single phase system.

(b) Calculate annual bill of a consumer whose maximum demand is 100kW, power factor = 0.8 lagging and load factor = 50%. The tariff used is Rs.75 per of maximum demand plus 20 paise per kWh consumed.

15 (a) Show that the insulation resistance of a cable is inversely proportional to its length.

(b) What are the methods of equalizing the potential distribution over a string of insulator?

16 Derive an expression for Capacitance of a three phase overhead transmission line when the conductors are un-symmetrically placed but transposed.

17 (a) Calculate the inductance of each conductor in a 3-phase, 3-wire system when the

conductors are arranged in a horizontal plane with spacing such that $D_{31} = 4\text{m}$;

$D_{12} = D_{23} = 2\text{m}$. The conductors are transposed and have a diameter of 2.5 cm.

(b) Discuss about the economics of power factor improvements.

FACULTY OF ENGINEERING

B.E. 2/4 II - Semester (EIE) (Backlog) Examination, October 2021

Subject: Thermodynamics and Fluid Mechanics

Time: 2 Hours

Max. Marks: 75

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any seven questions.

(7x3 = 21 Marks)

- 1 Explain the significance of Clausius Inequality.
- 2 Define the second law of thermodynamics.
- 3 State the principle of increase of Entropy.
- 4 Sketch Joule Cycle on P-V plot.
- 5 State the advantages of closed type gas turbine cycle.
- 6 Define Uniform and Non-uniform flow.
- 7 Define Kinematic Viscosity and State its SI & MKS units.
- 8 How is Path line different from Streak line?
- 9 What is the difference between Impulse and Reaction turbines?
- 10 Define Reynolds number & briefly state its significance.

PART – B

Note: Answer any three questions.

(3x18 = 54 Marks)

- 11 With the help of a neat sketch, explain the working of a four stroke IC engine.
- 12 (a) Derive an expression for efficiency of a two stage reciprocating air compressor.
(b) Compare open and closed type gas turbine cycles.
- 13 Explain the working principle of closed cycle Gas Turbine with a neat sketch. What are the relations for work done and efficiency?
- 14 A 2-stroke diesel engine has a bore of 110 mm and stroke of 150 mm. The engine runs at a mean piston speed of 5 m/s. It develops a torque of 56.3 N-m. The mechanical efficiency of the engine is 80% and the indicated thermal efficiency is 40%. Assuming a calorific value of 44800 kJ/kg for fuel. Calculate: (i) Indicated power; (ii) Indicated mean effective pressure; (iii) Brake specific fuel consumption.
- 15 Obtain expression for volume flow rate through a venturimeter using Bernoulli's equation.
- 16 A turbine is to operate under a head of 25 m at 200 r.p.m. The discharge is $9\text{ m}^3/\text{s}$. If the overall efficiency is 90 per cent, determine:
 - (i) Power generated;
 - (ii) Specific speed of the turbine;
 - (iii) Type of turbine.
- 17 Write about:
 - (a) Laminar and Turbulent flow in circular pipes
 - (b) Moody's chart.

FACULTY OF ENGINEERING**BE 2/4 (M/P) II-Semester (Backlog) Examination, October 2021****Subject: Thermodynamics****Time: 2 Hours****Max. Marks: 75****Note: (Missing data, if any, may be suitably assumed).****PART – A****Answer any seven questions.****(7x3 = 21 Marks)**

- 1 Define intensive and extensive properties with examples.
- 2 What do you understand by quasi static process?
- 3 Define work and mention the various forms of work.
- 4 Discuss the limitations of first law of thermodynamics
- 5 Define PMM-I and PMM-II.
- 6 Define reversible process and irreversible process.
- 7 Define pure substance and give some examples.
- 8 What is the use of Mollier diagram?
- 9 Draw the P-V and T-S diagram for Otto cycle.
- 10 Define mole fraction and volume fraction.

PART- B**Answer any three questions.****(3x18 = 54 Marks)**

- 11 (a) Explain the concept of thermodynamic equilibrium.
(b) Define thermodynamic system and explain the various types with examples.
- 12 (a) Explain the first law of thermodynamics and mention its limitations.
(b) A mass of 8 kg gas expands within a flexible container so that the p-v relationship is of the form $pv^{1.2} = \text{constant}$. The initial pressure is 1000 kPa and the initial volume is 1 m^3 . The final pressure is 5 kPa. If the specific internal energy of the gas decreases by 40 kJ/kg, find the heat transfer in magnitude and direction.
- 13(a) Explain the Kelvin Planck and Clausius Statements of Second Law of thermodynamics with suitable sketches.
(b) Explain the various Carnot's theorems.
- 14 (a) Define saturated liquid, wet steam, saturated (dry) steam, superheated steam and dryness fraction. Show them on a T-S diagram for steam.
(b) Derive the four Maxwell's relations.
- 15 (a) Explain the working of a Rankine cycle with suitable sketches and obtain expression for the thermal efficiency of a Rankine cycle.
(b) Explain Dalton's law of partial pressures and Amagat-Deduc's Law of partial volumes for gas mixtures.

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16 (a) Define Enthalpy, Internal Energy, Gibbs Function and Helmholtz functions.

(b) Find the enthalpy, entropy and volume of steam at 1.4 MPa, 375°C.

17 (a) Explain the applications of steady flow energy equation with examples.

(b) State and explain the Zeroth Law of thermodynamics.

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FACULTY OF ENGINEERING**B.E. 2/4 II - Semester (IT) (Backlog) Examination, October 2021****Subject: Web Technologies****Time: 2 Hours****Max. Marks: 75****(Missing data, if any, may be suitably assumed)****PART – A****Note: Answer any SEVEN questions.****(7x3 = 21 Marks)**

- 1 Explain different table tags used in HTML.
- 2 Mention JSON fundamentals.
- 3 What is J Query?
- 4 Define JSP directives with example.
- 5 Define page directives of JSP.
- 6 Give the difference between JSP and Servlet.
- 7 Define Web Service.
- 8 With a template define WSDL.
- 9 State goals of UDDI.
- 10 Describe the web controls used in ASP.NET.

PART – B**Note: Answer any THREE questions.****(3x18 = 54 Marks)**

- 11 (a) Explain and implement the basic tags of HTML.
(b) Explain the CSS Box model.
- 12 Write the XML schema for the XML document which has the student details with the following fields (regno, studname, phone, email-ID). Also assume values of each field.
- 13 Write a Java Servlet program to show passing of initialization parameters from web.xml.
- 14 (a) What is MVC model?
(b) Explain the processing of SOAP message.
- 15 (a) How to access MS Access database using JSP?
(b) Describe use of UDDI registry for implementing a web service.
- 16 (a) Explain with an example how UDDI and WSDL work together.
(b) Describe the rich controls used in ASP. NET.
- 17 (a) Explain the working of ASP .NET and AJAX, with suitable example.
(b) How to manage data using ADO.NET.
