



Course: Engineering Physics  
Date: 14/3/2023

**DEPARTMENT OF PHYSICS**

Course Code: PYC12  
Term: 30/11/2022 to 21/3/2023

CIE Test- 2  
Max. Marks: 30  
Duration: 1 hour

**Answer any two full questions.**

( $e = 1.6 \times 10^{-19} \text{ C}$ ,  $h=6.63 \times 10^{-34} \text{ Js}$ ,  $k = 1.38 \times 10^{-23} \text{ J/K}$ ,  $m_e = 9.1 \times 10^{-31} \text{ kg}$ ,  $m_p = m_n = 1.67 \times 10^{-27} \text{ Kg}$ ,  $C=3 \times 10^8 \text{ m/s}$ )

1	(a)	Derive the expression for density of states in a metal. Show graphically how $g(E)$ varies with $E$ .	7
	(b)	Explain how Bloch sphere is used to represent a qubit.	5
	(c)	The dielectric constant of Sulphur is 3.4. Assuming cubic lattice for Sulphur, calculate the electronic polarizability. Given density and atomic weight of Sulphur are 2.07g/cc and 32.07kg respectively.	3
2	(a)	Explain the set up and theory of Stern-Gerlach experiment with suitable diagrams.	7
	(b)	Define Fermi-Dirac distribution function. Explain how $f(E)$ varies at $T=0 \text{ K}$ and $T > 0 \text{ K}$ with energy. Sketch the variation	5
	(c)	Find the constant "a" so that the states $ \psi\rangle = a \phi_1\rangle + 5 \phi_2\rangle$ and $ \chi\rangle = 3a \phi_1\rangle - 4 \phi_2\rangle$ are orthogonal; consider $ \phi_1\rangle$ , and $ \phi_2\rangle$ to be orthonormal.	3
3	(a)	Explain internal field in di-electrics. Obtain an expression for the internal field in case of 1-D array of polar molecules and extend it for a cubic lattice.	7
	(b)	What is a qubit? Explain the distinction between a bit and a qubit.	5
	(c)	The probability of occupancy of a level with energy $E_F + 0.5 \text{ eV}$ is 1% at a temperature $T$ . Calculate $T$ .	3

Sub Code: MAC11	Sub: ADVANCED CALCULUS AND MODULAR ARITHMETIC	Test: II
Semester: I	Term: Dec 2022 to Mar 2023	Marks: 30
Date: 11.03.2023	Time: 09.30 – 10.30 AM	Sections: CSE Stream

Note: Answer any TWO full questions. Each main question carries 15 marks

Q. No.	Questions	Blooms Level	CO's	Marks
1.	(a) State Stoke's theorem.	L1	CO4	2
	(b) Evaluate $\iint_R r \sin \theta dr d\theta$ , where $R$ the region is bounded by the cardioid $r = a(1 - \cos \theta)$ above the initial line.	L2	CO3	3
	(c) By changing the order of integration, evaluate $\iint_0^{\pi} \int_0^{r^2/\sqrt{y}} xe^{-x^2/y} dy dx$	L3	CO3	5
	(d) Show that $\int_0^{\pi/2} \sqrt{\sin \theta} d\theta \times \int_0^{\pi/2} \frac{1}{\sqrt{\sin \theta}} d\theta = \pi$ .	L4	CO3	5
2.	(a) Write the transformations for changing Cartesian coordinates into cylindrical coordinates.	L1	CO3	2
	(b) Find the total work done by a force $\vec{F} = 2xy \hat{i} - 4z \hat{j} + 5x \hat{k}$ along the curve $x = t^2$ , $y = 2t + 1$ , $z = t^3$ from $t = 0$ to $t = 1$ .	L2	CO4	3
	(c) Evaluate $\int_C (xy + y^2) dx + x^2 dy$ where $C$ is bounded by $y = x$ and $y = x^2$ by using Greens theorem.	L4	CO4	5
	(d) Evaluate the integral $\iint_0^{\infty} e^{-(x^2+y^2)} dy dx$ by changing to polar coordinates.	L3	CO3	5
3.	(a) State division algorithm.	L1	CO5	2
	(b) Prove that if $a b$ and $a c$ then $a bm+nc$ where $m,n$ are integers.	L2	CO5	3
	(c) Find the volume of the sphere $x^2 + y^2 + z^2 = a^2$ using triple integration.	L5	CO3	5
	(d) Evaluate $\int_S \vec{F} \cdot \vec{n} ds$ where $\vec{F} = 4x \hat{i} - 2y^2 \hat{j} + z^2 \hat{k}$ and $S$ is the surface bounding the region $x^2 + y^2 = 4$ , $z = 0$ , using Gauss divergence theorem.	L4	CO4	5

**RAMAIAH INSTITUTE OF TECHNOLOGY**

(Autonomous Institute, Affiliated to VTU)

**DEPARTMENT OF HUMANITIES**

**Programme: BE I Semester (Common for all branches)**

<b>Term:</b> 30/11/2022- 10/03/2023	<b>Course:</b> Communicative English	<b>Course Code:</b> HSCP15
<b>CIE:</b> Test-2	<b>Semester:</b> I	<b>Sec:</b> A to L
<b>Date:</b> 13/03/2023	<b>Time:</b> 1 Hour	<b>Max Marks:</b> 30 <b>Credits:</b> 1.00

**Portions for the test:** Unit-3, 4 & 5

\* Instructions: Part-A (MCQ) is compulsory. Part-B: Answer **ANY TWO** full questions.

Q. NO	QUESTIONS	Marks	Bloom's Level	Co's
1.	Choose the correct option for the following questions.	[6X1=6]	Lo <sub>1</sub>	Co <sub>5</sub>
1.	Let's go out for coffee <u>after</u> lunch. Underlined word is _____ A] pronoun      B] preposition      C] verb      D] adjective			
2.	Figurative expression of an idiom " <u>Give cold shoulder</u> " is _____ (Fill in the blank with the correct meaning) A] Shiver      B] Cold meat      C] To ignore      D] To support			
3.	The king planned to murder his stepson, but his evil plan _____ (Fill in the blank with the correct word) A] unfired      B] dis fired      C] mis fired      D] ilfired			
4.	I _____ her for several years. A] has known      B] have know      C] knows      D] knew			
5.	Which one of the following is not an example of 'intrapersonal communication'? A] Sending a text message to a friend.      B] Talking to yourself. C] Writing a reminder note to yourself.      D] Thinking about a problem you need to solve.			
6.	In an 'oral presentation', the speaker should not _____ A] panic      B] pause      C] make eye contact      D] inspire			
	Part-B			
	Answer <b>ANY TWO</b> full questions for the following.	[2X12=24]	Lo <sub>3</sub>	Co <sub>3</sub>
2. A.	Give the figurative meaning and frame the sentences for the following idioms. 1. Face the music      2. A bolt from the blue      3. Spill the beans 4. Once in a blue moon      5. Hit below the belt      6. Turn over a leaf	6	Lo <sub>2</sub>	Co <sub>3</sub>
B.	Fill in the blanks using the correct articles.	6	Lo <sub>1</sub>	Co <sub>3</sub>
	Several witnesses at _____ American airbase claimed to have seen _____ identical object half _____ hour before what _____ pilots experienced. Officials from _____ US government were able to rule out _____ possibility of it being a military or commercial flight as there were no such flights scheduled at that time.			
3. A.	Do as directed.	6	Lo <sub>1</sub>	Co <sub>4</sub>
1.	It <u>will be</u> dark soon. (Identify the tense of the underlined verb)			
2.	The match <u>starts</u> at 11.5am. (Identify the tense of the underlined verb)			
3.	At 3 o'clock tomorrow, I <u>wrote</u> my exam. (Fill in the blank using the given verb in the correct tense)			
4.	By June next year, I <u>study</u> in this college for two years. (Fill in the blank using the given verb in the correct tense)			
5.	If <u>he'd</u> prepared well for his presentation, he <u>would've</u> been more confident. (Write the full form for the underlined contracted form)			
6.	<u>You're</u> expected to register for the event before the weekend. <u>We've</u> been allotted the fifth room on this floor for our presentation. (Write the full form for the underlined contracted form)			
B.	Add suitable affixes to form what is indicated in the brackets. One has been done for you. In + adequate (Antonym) = Inadequate	6	Lo <sub>1</sub>	Co <sub>4</sub>
	1. Suffocate (noun)      2. Attract (adjective)      3. Satisfy (antonym) 4. Capable (noun)      5. Beauty (adjective)      6. Healthy (antonym)			
4. A.	Prepare an extempore speech on the following topic: 'Artificial Intelligence (AI) in the 21 <sup>st</sup> century'. (Word limit:250)	6	Lo <sub>6</sub>	Co <sub>5</sub>
B.	Why 'technology' is so important while planning and execution of 'public speaking'? Justify your answer.	6	Lo <sub>4</sub>	Co <sub>5</sub>

**Ramaiah Institute of Technology. (Autonomous Institute, Affiliated to VTU)**  
**Department of Humanities, Program: B. E**

Term:00-00- 23 to 00-00-23	Course:KANNADA KALI	Course Code:HSCP16K/26
CIE: Test 2	Semester: I	Sec: A TO L
Max Marks: 30	Time: 1Hr	Date: 14- 03 - 2023

Portions for the test: UNIT- 3 4 & 5

Instructions to Candidates: ANSWER THE QUESTIONS

Sl#	Questions <u>PART- A</u>	Marks	Bloom's level	COs
I.A	<p><b>choose the correct answers for the following :</b></p> <p>a.plural form of pakshi      i) hakki ii)giDa iii) pakshi iv)pakshigaLu            b.saavira means              i)200 ii)thousand iii) fifty iv) hundred            c.ivathu yaava ?              i) samaya ii) vaara iii) uuru iv) enTne.            d.write equivalent of hasiru.      i) kempu ii ) green iii)blue iv) orange            e. write the opposite of oLage:      i) good ii) horage iii) keTTa iv ) bad            f. nannage niili baNNa .      i) kasTa ii) baTTe iii) down iv) koDi    <b>PART- B</b></p>	(6)	L 1, 2 3	Co2
II A.	<b>Write opposite words and fame sentence for these following words :(using English letter)</b> Horade , meeLe , iiga , saNNa , howdu , nagu , kattale, beega , beeDa , swalpa , hattira, duura.	(6)	L 3 4 5	Co1
B.	<b>Write kannada digits and kannada names .</b> 360 , 24, 238, 682, 259,167, 598/73	(6)	L2 3	
III. A	<b>Translate these and Answer the following in kannada using English letter.</b> 1. nimmage yava baNNa ishTa ? 2.yavudadaru naLakku tarakari gala hearisi ? 3. naaLe yaava vaara ? 4. kannada bhashege eshTu janapiita prashasti banndive ? 5. karnatakada rajya dhani yaavudu ? 6. kannDada yavu daadaru obha kaviya hesaru bareiri ?	(6)	L- 2	Co1C o2
B.	<b>Write about kannada and Karnataka . (Using English letter ).</b>	(6)	L -1	

Term: 30-11-2022 to 21-03-2023  
CIE: 2

Department of Electronics and Communication  
Ramaiah Institute of Technology  
Program: BE Course: Introduction to Electronics Engineering Course Code: ESC133  
Semester: I Sec: A to J

Max Marks: 30 Instructions to Candidates: Answer Any Two

Mobile Phones and smart watches are banned

Sl#	Question	Marks
1. a)	Devise a logic arrangement using no more than four two input gates that will satisfy the truth table shown in Table-1.	5
b)	Explain various types of amplifiers and mention their applications.	7
c)	Mention the differences between microprocessor and microcontroller systems.	3
2. a)	With a neat block diagram explain computer system.	6
b)	With a neat diagram explain a common emitter amplifier with effective bias stabilization.	6
c)	With the help of lamp logic explain OR gate and write its truth table.	3
3. a)	With a neat diagram explain the operation of S-R bistable using NOR gates and write the truth table.	7
b)	Explain data representation and data types with respect to microprocessor.	5
c)	An amplifier produces an output voltage of 2 V for an input of 50 mV. If the input and output currents in this condition are respectively 4 mA and 200 mA, then determine the voltage gain, current gain and power gain.	3

PTO

## Internal Assessment Question Paper -2

Programme: B.E

Semester: I	Course Name: A Scientific Approach to Health	Course Code: AEC017
CIE: Test 2	Term: November 2022 to March 2023	Section: A to L
Max. Marks: 30	Duration of Test: 1 Hour	Time: 12.30pm to 1.30pm
Credits: 1:0:0	Test Portions: LP-06 to 11 (Unit III and Unit IV)	Date: 11.03.2023

## Section-I

## Objective type One-Mark Questions

Answer All Questions (Write the Correct Answer in the Blue Book)	6 X 1 = 6 Marks
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1. Communication is the art of transmitting -----	a) Emotions from one person to another c) Tools from one person to another	b) Information from one person to another d) Control signals from one person to another
2. Friendship is defined as:	a) Relationship of obligation c) Relationship of mutual affection between people	b) Relationship between people with conditions d) Relationship between people
3. An unhealthy relationship causes:	a) Stronger heart and healthy brain c) Happiness & longer life	b) Stress and loneliness d) Good sleep
4. The health promoting behavior are:	a) Regular activities, no drugs c) Alcohol consumption	b) High fat diet d) No medication during illness
5. Cognitive-behavioral therapy (CBT) helps:	a) In avoiding heart disease c) To have good self-control	b) To cure diabetes d) Addicted patients to overcome substance abuse
6. Gastritis is due to:	a) Inflammation of the lining of the stomach c) Inflammation of the throat	b) Inflammation of the heart d) Inflammation of the lining of the nose

## Section-II

Answer Any 2 Full Questions out of the given 3 Questions

Q. No.	Questions	Marks
1(a).	What are the important characteristics of communication skills?	4
1(b).	In a psychology class the teacher was explaining about how effective is: <b>a simple conversation</b> . Some students were not able to start any conversation which was an activity for them.  How teacher helps the students to complete the activity?	4
1(c).	What are the different factors that affect health-related behavior?	4
2(a).	List 4 complications that occur due to use of harmful drugs.	4
2(b).	Ann & Bob were neighbors and college children but never got along. Both loved a street dog. One day the dog went missing. Ann & Bob were restless and together went on a mission to trace the dog and were able to rescue it. They both shook hands and forgot their bitterness. a) What made them to compromise? b) What are the qualities of true friend?	6
2(c).	How addiction develops?	2
3(a).	How do one change health behaviors through social engineering?	4
3(b).	The youth of the present day are more dependent and addicted to use of mobile phones. Is it a good practice or bad? Write your own comments.	4
3(c).	Give some measures used to prevent drug abuse.	4

Term: 30-11-2022 to 10-03-2023

CIE: 1

Max Marks: 30

Department of Electronics and Communication  
Ramaiah Institute of Technology

Program: BE Course: Introduction to Electronics Engineering

Semester: I

Course Code: ESC133

Sec: A to J

Mobile Phones are banned

Instructions to Candidates: Answer Any Two

S #	Question	Marks
1. a)	Explain how a LED can be used to indicate the presence of dc supply voltage.	4
b)	With a neat circuit and waveforms explain Bi-phase rectifier with reservoir capacitor.	7
c)	The following data was obtained during a test carried out on the regulator Output voltage (with 0.2A load current) =12.2V      Output voltage (with mains input of 230V) =12.1 V Output voltage (with 0.5A load current) =11.8V      Output voltage (with mains input of 200V) =11.95V Determine the output resistance, regulation and estimate the output when the load current is 400mA.	4
2. a)	A mains transformer having the turns ratio of 20:1 is connected to a 230V ac mains. If the secondary voltage is applied to bridge rectifier, determine the peak voltage that appears across the load.	3
b)	Explain the input, output and transfer characteristics of a transistor in Common emitter mode.	8
c)	Draw the general block diagram of a dc power supply and explain.	4
3. a)	Design a Zener voltage regulator with the following specifications: Supply voltage of 25V, reference output voltage of 10V with a load current of 15mA and the maximum power rating of Zener is 500mW.	5
b)	With a neat diagram, explain the circuit which provides output dc voltage twice that of peak value of ac input.	6
c)	Explain the construction of NPN transistor.	4

$$V_{m^2} \approx 15 \quad \sqrt{t} = 8^{-2}$$

**Department of Electronics and Communication  
Ramaiah Institute of Technology**

**Term: 30-11-2022 to 10-03-2023  
CIE: 1**

**Program: BE Course: Introduction to Electronics Engineering  
Semester: I**

**Course Code: ESC133**

**Sec: A to J**

**Max Marks: 30 Instructions to Candidates: Answer Any Two**

**Mobile Phones are banned**

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$$V_{IM} = 15 \quad V_T = 8.2$$

**RAMAIAH INSTITUTE OF TECHNOLOGY**

(Autonomous Institute, Affiliated to VTU)

**DEPARTMENT OF HUMANITIES**
**Programme: BE I Semester (Common for all branches)**

Term: 30/11/2022- 10/03/2023	Course: Communicative English	Course Code: HSCC15/HSCV15
CIE: Test-1	Semester: I	Sec: A to L
Date: 20/01/2023	Time: 1 Hour	Max Marks: 30
• Portions for the test: Unit-1 & 2		Credits: 1:0:0
• Instructions: Part-A (MCQ) is compulsory. Part-B: Answer <u>ANY TWO</u> full questions.		

Q. NO	QUESTIONS	Marks	Bloom's Level	Co
<b>Part-A (MCQ Compulsory)</b>				
1.	Choose the correct option for the following questions.	[6X1=06]	Lo1	Co1,2
1.	Who encodes a message? A. Transmitting medium    B. Receiver    C. Sender    D. Both (a) and (b)			
2.	Which of the following is an 'oral communication'? A. Notices    B. Dictation    C. Brochures    D. Letters			
3.	In communication, the observation of receiver's response is called _____ A. Message    B. Survey    C. Channel    D. Feedback			
4.	How many syllables are in the word 'Psychologists'? A. 5 syllables    B. 4 syllables    C. 3 syllables    D. 2 syllables			
5.	Which of these terms refers to the study of speech process? A. Semantics    B. Phonetic substances    C. Phoneme    D. Phonology			
6.	All of the following functions are true of intonation except _____ A. Intonation helps words to communicate messages and emotions. B. Intonation emphasizes every word in speech. C. Intonation is the punctuation of our speech. D. Intonation has an indexical function.			
<b>Part-B (Descriptive Questions)</b>				
Answer <u>ANY TWO</u> full questions for the following.		[2X12=24]	Lo1	Co1-5
2. A.	Discuss verbal and non-verbal communication and its importance in the profession.	6	Lo2	Co1
B.	Show the division of syllables in the following words. Ex: Window: win-dow 1. Perhaps    2. Telephone    3. Information 4. Management    5. Activity    6. Concentrate	6	Lo1	Co2
3. A.	What are the barriers affected to your effective communication?	6	Lo2	Co1
B.	Explain the 'word stress' with suitable examples.	6	Lo2	Co2
4. A.	Elaborate on how the 7 C's of communication help your effective communication.	6	Lo4	Co1
B.	Explain the types of 'intonation' you use to make your communication effective with suitable examples.	6	Lo2	Co2

**Ramaiah Institute of Technology. (Autonomous Institute, Affiliated to VTU)**  
**Department of Humanities, Program: B. E**

Term:31-12-23 to10-03-23	Course: KANNADA KALI	Course Code:HSCC16K/HSCV16K
CIE: Test 1	Semester: I	Sec: A TO L
Max Marks: 30	Time: 1Hr	Date: 21- 01 - 2023

**Portions for the test: UNIT-1 & 2**

**Instructions to Candidates: ANSWER THE QUESTIONS**

Sl#	Questions	PART -A	Marks	Bloom's level	COs
I.A	Choose the correct answers for the following: a. _____ nanna sneehita. i) adu ii) avanu iii) avaLu iv) adara b. avaLu _____ oLLeya huDugi. i) tumbaa ii) snehitha iii) mane iv) ide c. write the opposite of duura - i) hosa ii)oLLeya iii) hattira iv) hwdu d. write the equivalent word . sarakari - i) new ii) old iii)government v) that e. nii <u>v<u>u</u></u> vasa idira ? i) jelli ii) yavudu iii) yara iv ) illa f. _____ nanna kaalleeju hosa kalleegu. i) idu ii) haydu iii) yara iv) dura PART -B		(6)	L 1, 2 3	Co2
II A.	Fill in the blanks using appropriate words given in the box (uuru, yaaru, alla , alla , oLLeya, tangi, nanna , enthahaddu, chennagi, nimma elli, yara hesaru Sneha . Nimma <u>mane</u> _____ ide ? nimma_____ yavudu? Nii <u>v<u>u</u></u> maga ? Ivaru_____ ? AvaLu nimma _____ na ? adu _____ pustaka ? niivu iddira ? nimma _____ kaaleeju ? _____ adu hosa kaaleeju_____ haLeyaddu. Adu kaleeju. OR		(12)	L2	Co1
B.	Write English equivalents and make sentence for the following words:(using English letter) Vidyarthi, Adyaapaki , Sneehita, doDDa , Havdu, Pustaka, chennagi, hege , tumba, Enth, raajya, Avanu		(12)	L 2 3	
III. A	Write kannada Alphabets a to La in kannada . (1 time )		(6)	L- 2	Co1 Co2
B.	Write six sentence about yourself in kannada using English letters.		(6)	L -1	

**Department of Physics, Ramaiah Institute of Technology, Bengaluru – 54**

*Engineering Physics (PYC12) for Computer Science Engineering (CSE) Stream*

Term: 09-12-22 to 10-03-23

**MOBILES ARE BANNED**

Max. Marks = 30

Duration: 1 hr

**CIE Test - 1**

Test date: 21-01-2023

( $h = 6.63 \times 10^{-34} \text{ Js}$ ,  $C = 3 \times 10^8 \text{ m/s}$ ,  $e = 1.6 \times 10^{-19} \text{ C}$ ,  $k = 1.38 \times 10^{-23} \text{ J/K}$ ,  $m_e = 9.1 \times 10^{-31} \text{ kg}$ . )

<b>Q No.</b>	<b>Answer any two full questions</b>	<b>Marks</b>
<u>1</u>	<p>a) Derive an expression for energy density of radiation in terms of Einstein's coefficients</p> <p>b) What is meant by intermodal dispersion? How it can be eliminated in graded index fibres.</p> <p>c) The kinetic energy of an electron is 80eV. Calculate the group velocity and phase velocity of the de-Broglie waves associated with it.</p>	<p>7</p> <p>4</p> <p>4</p>
<u>2</u>	<p>a) Define numerical aperture and angle of acceptance. Obtain the condition for propagation of light through an optical fibre.</p> <p>b) Derive the relation between group velocity and phase velocity in dispersive medium.</p> <p>c) Calculate the number of photons emitted per second by He-Ne laser emitting a wavelength of 632.8nm with an optical power of 20mW.</p>	<p>7</p> <p>4</p> <p>4</p>
<u>3</u>	<p>a) Solve Schrodinger's wave equation for a particle confined in a 1-D potential well of infinite height. Obtain Eigen functions and Eigen values</p> <p>b) With neat sketch and energy band diagram, explain the working of semiconductor laser</p> <p>c) The relative RI of an optical fibre is 2% for a core RI of 1.52. If the diameter of the core is 80<math>\mu\text{m}</math>, Calculate the number of modes for an operating wavelength of 0.8<math>\mu\text{m}</math></p>	<p>7</p> <p>4</p> <p>4</p>

<b>Sub Code:</b> MAC11	<b>Sub:</b> ADVANCED CALCULUS AND MODULAR ARITHMETIC	<b>Test:</b> I
<b>Semester:</b> I	<b>Term:</b> Dec 2022 to Mar 2023	<b>Marks:</b> 30
<b>Date:</b> 19.01.2023	<b>Time:</b> 09.30 – 10.30 AM	<b>Sections:</b> CSE Stream

Note: Answer any TWO full questions. Each main question carries 15 marks

Q. No.	Questions	Blooms Level	CO's	Marks
1.	<p>(a) Write the expression for angle between the radius vector and the tangent. Also define the terms involved.</p> <p>(b) Find <math>\frac{\partial u}{\partial x}</math> and <math>\frac{\partial u}{\partial y}</math> for <math>u = y^x + \frac{x}{2y}</math>.</p> <p>(c) If <math>\rho_1</math> and <math>\rho_2</math> are the radii of curvature at the extremities of any chord of the cardioid <math>r = a(1+\cos\theta)</math> and which passes through the pole then show that <math>\rho_1^2 + \rho_2^2 = \frac{16a^2}{9}</math>.</p> <p>(d) If <math>\vec{F} = (x+y+az)\hat{i} + (bx+2y-z)\hat{j} + (x+cy+2z)\hat{k}</math> then find the values of <math>a, b, c</math> such that <math>\text{curl } \vec{F} = 0</math>. Also find its scalar potential.</p>	L1 L2 L3 L4	CO1 CO2 CO1 CO2	2 3 5 5
2.	<p>(a) Write the expression for radius of curvature for curves in polar and pedal form.</p> <p>(b) Find the angle of intersection of the pairs of curves <math>r = ae^\theta</math> and <math>re^\theta = b</math>.</p> <p>(c) Find the values of constants <math>a, b, c</math> so that the maximum value of the directional derivative of <math>\phi = axy^2 + byz + cz^2x^3</math> at <math>(1, 2, -1)</math> has a magnitude 64 in the direction parallel to the <math>z</math>-axis.</p> <p>(d) If <math>z = f(x, y)</math> and <math>x = e^u + e^{-v}</math>, <math>y = e^{-u} - e^v</math> then show that <math>\frac{\partial z}{\partial u} - \frac{\partial z}{\partial v} = x \frac{\partial z}{\partial x} - y \frac{\partial z}{\partial y}</math></p>	L1 L2 L5 L3	CO1 CO1 CO2 CO2	2 3 5 5
3.	<p>(a) Define Solenoidal and irrotational vectors.</p> <p>(b) Find <math>\frac{ds}{dx}</math> for the curve <math>x^{2/3} + y^{2/3} = a^{2/3}</math>.</p> <p>(c) If <math>x = r\cos\theta, y = r\sin\theta</math> then show that <math>JJ' = 1</math>.</p> <p>(d) Find the pedal equation to the curve <math>\frac{2a}{r} = 1 + \cos\theta</math>.</p>	L1 L2 L3 L4	CO2 CO1 CO2 CO1	2 3 5 5

**Internal Assessment Question Paper – 1**  
**Ramaiah Institute of Technology**  
**(Autonomous Institute, Affiliated to VTU)**  
**Department of Computer Science and Engineering**

**Programme: B.E**

**Course : Principles of Programming Using C**

**CIE: Test I**

**Max Marks: 30**

**Date: 20/01/2023**

**Term: Nov-March 2023**

**Course Code : PPC18**

**Section: A to J**

**Portions for Test: L1-15**

**Instructions to Candidates:**

**1. Answer two full questions. Question one is compulsory.**

**2. Each Question carries 15Marks.**

**3. Mobiles, smart watches or any electronic gadgets are strictly banned.**

Sl#	Question			Marks	Bloom's Level	CO Mapping
1 a)	<p><b>1. Which of the following array initialization statements is valid?</b></p> <p>a. int array{} = {1,2,3,4};  b. int array[] = [1,2,3,4];  c. int array[] = {1,2,3,4};  d. int array{4} = [1,2,3,4];  e. int array[4] = [1,2,3,4];</p> <p><b>2. Evaluate the following expressions to true or false.</b></p> <p>a. !(3+3&gt;=6)  b. 1+6==7  3+2==1  c. 1&gt;5  6&lt;50&amp;&amp;2&lt;5  d. 14!=55&amp;&amp;!(13&lt;29)  31&gt;52</p> <p><b>3. What would be printed from each of the following segments? Compare and Contrast your answers.</b></p> <pre>x=12; while(x=7) {     printf("%d\n", x);     x--; }</pre> <pre>for(int x=12; x&gt;7; x--) ) printf("%d\n",x);</pre> <pre>x=12; do {     printf("%d\n",x);     x--; } while(x&gt;7);</pre>		01M	L3	CO2,CO3	
			02M			
	<p><b>4. If originally x=4, y=0 and z=2, what is the value of x, y and z after executing the following code?</b></p> <pre>if(z == 0    x &amp;&amp; !y)     if(!z)         y=1;     else         x=2;</pre>		01M			
b)	With a neat diagram, Explain the structure of C Program.		04M	L2	CO1	
c)	<p>Write a C program to read the name of the user, number of units consumed and print out the charges.</p> <p><b>An electricity board charges the following rates for the use of electricity:</b></p> <ul style="list-style-type: none"> <li>For the first 200 units 80 paise per unit</li> <li>For the next 100 units 90 paise per unit</li> <li>Beyond 300 units Rs 1 per unit.</li> </ul> <p><b>Note:</b></p> <ol style="list-style-type: none"> <li>All users are charged a minimum of Rs. 100 as meter charge.</li> <li>If the total amount is more than Rs 400, then an additional surcharge of 15% of total amount is charged.</li> </ol>		05M	L3	CO2	

2 a)	Discuss how <b>one dimensional array</b> is declared and initialized with suitable example.	04M	L2	CO3
b)	Write a C program to check whether a given number is palindrome or not <b>using while loop</b> .	05M	L3	CO2
c)	Explain the syntax of a <b>switch statement</b> . Write a C program to perform arithmetic operations using switch statement.	06M	L3	CO2
3 a)	<b>Define the following terms in Computer Systems:</b> 1. System Software and Application Software 2. Operating System 3. Pseudocode 4. Distributed Computing 5. System Development Life Cycle.	05M	L1	CO1
b)	Write a C program to calculate the factorial of a number <b>using for loop</b>	05M	L3	CO2
c)	Write a C program to read “N” integer numbers into an array and sort them in ascending order using <b>bubble sorting technique</b>	05M	L3	CO3

**Course Outcomes meant to be assessed by the IA Test: CO1, CO2 & CO3**

- CO1: Identify the basic elements of Computing Systems and C Programming Constructs.
- CO2: Demonstrate the use of Operators & Expressions, Decision Making and Looping Statements.
- CO3: Explore Arrays and User-Defined Functions in Implementing Solutions to Real world Problems.

**Internal Assessment Question Paper -1**
**Programme: B.E**
**Semester: I**
**CIE: Test 1**
**Max. Marks: 30**
**Credits: 1:0:0**
**Course Name: A Scientific Approach to Health**
**Term: November 2022 to March 2023**
**Duration of Test: 1 Hour**
**Test Portions: LP-01 to 05 (Unit I and Unit II)**
**Course Code: AECC17**
**Section: A to L**
**Time: 12.30pm to 1.30pm**
**Date: 19.01.2023**
**Section-I**
**Objective type One-Mark Questions**
**Answer All Questions (Write the Correct Answer in the Blue Book)**
**6 X 1 = 6 Marks**

1. This dimension relates to the functioning of the body and its systems, it includes the physical capacity to perform daily activities or tasks.

- a) Physical health & wellbeing  
 b) Spiritual health & wellbeing  
 c) Mental health & wellbeing  
 d) Social health & wellbeing

2. Fruits and vegetables are important because:

- a) To give you energy  
 b) They provide you with wide variety of vitamins, minerals and nutrients  
 c) They are colorful  
 d) They are easily available

3. Suggestions for reducing 'Stress'

- a) Slow down, do something different  
 b) Do not take breaks  
 c) Run fast  
 d) Do not change your attitude

4. According to food guide pyramid fats oils and sweets should be used

- a) 2-3 servings  
 b) Frequently  
 c) Sparingly  
 d) 2-4 servings

5. Malnutrition means:

- a) A person is not eating properly  
 b) Undernutrition or over-nutrition  
 c) Someone is starved  
 d) Someone is eating too much

6. Eating disorders may cause:

- a) Psychological disorders  
 b) Physiological disorders  
 c) Mental stress  
 d) Anxiety

**Section-II**
**Answer Any 2 Full Questions out of the given 3 Questions**
**Question**

Q.No.	Answer Any 2 Full Questions out of the given 3 Questions	Marks						
1(a).	Why is Health important?	4						
1(b).	Explain the ways to foster positive thinking	4						
1(c).	Bring out the importance of knowing the healthy food pyramid and the need to adapt in our life	4						
2(a).	What are the common causes of work related stress? How to over come?	4						
2(b)	List and explain all the 4 methods used to improve the good psychological health	4						
2(c)	<p>Your classmate usually sits at the very back of your engineering class and keeps to self. Today You notice him/her frantically shuffling the body and after a while your classmate hastily grabs the belongings and runs out of the class, sweating profusely. You decide to follow him/her out of class to see how he/she doing. When you talk to him/her, you are told that he/she was just anxious and needed to get out of the room to relax.</p> <p>(i) Identify two Key points  (ii) Identify one Possible response</p>	4						
3(a)	What is mindfulness. Explain with an example	3						
3(b)	Discuss about the Eating disorder and its types.	3						
3(c)	Six women are chosen for a study. Their details are tabulated below. Calculate the Body Mass Index (BMI). Write your analysis on the calculated values and list the various factors that influence BMI.	6						
	<table border="1" data-bbox="271 1821 1419 2023"> <tr> <td data-bbox="271 1821 457 1978"> 145 cms ; 70 kgs</td><td data-bbox="457 1821 643 1978"> 170 cms ; 70 kgs</td><td data-bbox="643 1821 828 1978"> 167 cms ; 70 kgs</td><td data-bbox="828 1821 1014 1978"> 173 cms; 70 kgs</td><td data-bbox="1014 1821 1200 1978"> 165 cms ; 70 kgs</td><td data-bbox="1200 1821 1419 1978"> 186 cms ; 70 kgs</td></tr> </table>	 145 cms ; 70 kgs	 170 cms ; 70 kgs	 167 cms ; 70 kgs	 173 cms; 70 kgs	 165 cms ; 70 kgs	 186 cms ; 70 kgs	
 145 cms ; 70 kgs	 170 cms ; 70 kgs	 167 cms ; 70 kgs	 173 cms; 70 kgs	 165 cms ; 70 kgs	 186 cms ; 70 kgs			

**M S Ramaiah Institute of Technology**  
**(Autonomous Institute, Affiliated to VTU)**  
**Department of Computer Science and Engineering**

**Programme: B.E.**

**Term: December 2022– March 2023 Course: Introduction to C++ Programming**

**CIE: Test 1**

**Max Marks: 30**

**Sem: I**

**Time: 1Hr**

**Course Code: PLC144**

**Date: 23/01/23**

**Portions for Test: LP 1- 11**

**Instructions to Candidates: First question is compulsory.**

**Answer any one full question from 2 or 3.**

Sl#	Question	Marks	Bloom's Level	Course Outcomes
1)a	Distinguish between procedure oriented programming and object oriented programming?	(5)	L2	CO1
b	I) Evaluate the following expressions and write the results of x, y, and z. Consider x = 2 and y=4 and all the variable are integers. i) $z = x++ * y$ ii) $z = ++x * y$ iii) $y \% = x$ II) List the basic datatypes available in C++ with examples.	(3) + (2)	L3	CO1
c	Write a C++ program to search an element in a character array using linear search	(5)	L3	CO2
2)a	Explain the following i) Class and Object ii) Polymorphism	(5)	L2	CO1
b	I) Assume the following variables declaration <code>int a = 0,b = 1,c = -1; float x = 2.5,y = 0.0;</code> Evaluate the following expressions: a. $a \leq 10 \ \&& \ x \geq 1 \ \&& \ b$ b. $--a * (5+b)/2 - c++ * b$ c. $a^* = b^* c$ II) What is the output of this C++ code? <pre>#include &lt;iostream&gt; using namespace std; int main() {     char suite = 3 ;     switch ( suite )     {         case 1:             cout&lt;&lt; "\nDiamond";         case 2:             cout&lt;&lt; "\nSpade";         default :             cout&lt;&lt; "\nHeart";     }     cout&lt;&lt; "\n Club" ; }</pre>	(3) + (2)	L3	CO2
c	Write a C++ program to find the sum of all the natural numbers from 1 to n	(5)	L3	CO2
	(OR)			
3)a	Explain the following: i) Data Abstraction & Encapsulation ii) Inheritance	(5)	L2	CO1

b	<p>I) Which of the following are invalid variable names and why?</p> <p>1. First_tag -      2. char -      3. average_number -      4. group one -</p> <p>II) Find the output for the following:</p> <pre>int main() { int a=2,b=3,c=4; if(a=b&lt;c) { c++; a--; } ++b; cout&lt;&lt;"\n"&lt;&lt;a&lt;&lt;b&lt;&lt;c; return 0; }</pre> <p>Answer: a= b= c=</p>	(2)	L3	CO2
c	Write a C++ program to find whether the entered number is palindrome or not.	(5)	L3	CO2

CO1: Explain the characteristics of Object oriented programming approach.  
 CO2: Develop programs in C++ based on decision making statements and arrays.



**USN 1 M S**  
**RAMAIAH**

(Approved by NBA & Institute of Technology)

(Autonomous Institute Affiliated to VTU)  
by AICTE, New Delhi & Govt. of Karnataka) Accredited  
NAAC with 'A' Grade

**SEMESTER END EXAMINATIONS - APRIL / MAY 2021**

Program : **B.E. : Common to all Programs**  
Course Name : **Basic Electronics**  
Course Code : **EC15/EC25/EC101/EC201**

Semester : **I / II**  
Max. Marks : **100**  
Duration : **3 Hrs**

**Instructions to the Candidates:**

- Answer one full question from each unit

**UNIT- I**

1. a) Derive the expression for the following parameters of Full Wave Rectifier.
  - Average DC Current
  - RMS value of current
  - Ripple factor
  - Efficiency.
 CO1 (08)
- b) Compare Half Wave Rectifier with Full Wave rectifier. CO1 (05)
- c) Design a Zener Regulator for the following specifications: output voltage is 6V, input voltage is  $10 \pm 2V$ , minimum zener current is 5mA and load current is 20mA & zener wattage is 500mW. CO1 (07)
  
2. a) Define PN diode with application. Explain the forward & reverse characteristics of PN diode. CO1 (05)
- b) In full wave bridge rectifier, the transformer secondary voltage is  $100\sin\omega t$ . The forward resistance of each diode is  $25\Omega$  and load resistor is  $950\Omega$ . Calculate the i) DC output voltage ii) Ripple factor iii) Efficiency of rectification iv) PIV. CO1 (07)
- c) With neat circuit diagram and waveform, illustrate the Input and output characteristics of common Emitter configuration. CO1 (08)

**UNIT - II**

3. a) Describe the important conditions for the sustained oscillations. CO2 (06)
- b) With neat circuit diagram, explain the working of Hartley oscillator and also mention the expression for frequency of oscillation. CO2 (08)
- c) Explain DC load line and Q point for base bias circuit. CO2 (06)
  
4. a) Explain the process of Amplification in CE transistor circuit. CO2 (06)
- b) A voltage divider bias circuit has  $V_{cc}=15V$ ,  $R_c=2.7Kohms$ ,  $R_e=2.2Kohms$ ,  $R_1=22kohms$ ,  $R_2=12Kohms$ . Calculate  $V_e$ ,  $V_c$ ,  $I_c$ ,  $V_{ce}$  and draw DC load line with Q point. CO2 (08)
- c) With neat circuit diagram explain the working of colpitts oscillator and also mention the expression for frequency of oscillations. CO2 (06)

**UNIT - III**

5. a) Explain the following parameters related to JFET: i) Transconductance ii)Amplification factor iii) Drain resistance. CO3 (06)
- b) With neat circuit diagram, explain Op-amp subtractor using superposition principle. CO3 (08)
- c) Draw the circuit for CMOS Inverter and explain its operation with input/output voltage characteristics. CO3 (06)
  
6. a) With neat circuit diagram and characteristics explain the working principle of MOSFET (n-channel depletion). CO3 (08)
- b) Explain (i) Virtual Ground concept (ii) Differential Gain (iii) CMRR applied to OP-AMP. CO3 (06)

## **EC15/EC25/EC101/201**

- c) An Op-Amp is used as an inverting amplifier to amplify an input sine wave of amplitude 100mV (peak to peak). The input resistance  $R_i=1K\Omega$  and feedback resistance  $R_f= 10K\Omega$ . Calculate the voltage gain and sketch the output waveform with neat circuit diagram. CO3 (06)

### **UNIT - IV**

7. a) i) Convert  $(A B C D)_{16} = (?)_2 = (?)_8 = (?)_{10}$  CO4 (06)  
ii) Subtract  $(1010)_2 - (111)_2$  using 2's compliment method.
- b) Design full adder circuit using three variables and implement it using two half adders. CO4 (08)
- c) With a neat circuit diagram and truth table, explain the working of a RS flip flop. CO4 (06)

8. a) Simplify the following Boolean expressions: CO4 (06)

i)  $Y = AB + AB$   
ii)  $Y = (B + CA)(C + \bar{A}B)$   
iii)  $Y = \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C}D + A\bar{B}\bar{C}\bar{D} + A\bar{B}CD$

- b) Define universal gates; implement basic gates using NAND and NOR universal gates. CO4 (08)
- c) Realize  $Y = AB + CD + E$  using NAND gates. CO4 (06)

### **UNIT - V**

9. a) With neat block diagram explain the working of satellite communication system. CO5 (10)  
b) Illustrate the working principle of Photo conductive, Photo emissive and photo voltaic cell in detail. CO5 (10)

10. a) With neat block diagram explain the working of basic digital communication system. CO5 (10)  
b) Identify different resistive transducers, and hence explain their respective operating principles. CO5 (10)

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# MAC 11

## UNIT - V

- ✓ 9. a) State division algorithm. CO5 (02)
- b) Using Fermat's theorem, find the remainder When  $16^{53}$  is divided by 7. CO5 (04)
- c) Find the general solution of the Diophantine equation  $1485x + 1745y = 15$ . CO5 (07)
- d) State and prove Wilson's theorem. CO5 (07)
10. a) Define linear congruence modulo  $m$ . CO5 (02)
- b) Prove that if  $(a,b) = 1 = (a,c)$  then  $(a,bc) = 1$ . CO5 (04)
- c) Solve the following system of linear congruence's by Chinese remainder theorem:  
 $x \equiv 1 \pmod{3}$   
 $x \equiv 2 \pmod{5}$   
 $x \equiv 3 \pmod{7}$  CO5 (07)
- d) Using Fermat's theorem, Solve the linear congruence  $37x \equiv 5 \pmod{11}$ . CO5 (07)

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# SEMESTER END EXAMINATIONS – MAY 2023

Program	: B.E :- Common to CSE / ISE / CSE(CY) / AI & DS / BT / AI & ML / CSE (AI&ML) / CV	Semester : I
Course Name	: Kannada Kali	Max. Marks : 50
Course Code	: HSCP16K	Duration : 2 Hrs

## Instructions to the Candidates:

- PART-A : Answer all the questions.
- PART-B : Answer one full question from the each unit.

## PART -A

### Choose the correct answers for the following :

CO2 (10)

- (1) nanna kaalleeju \_\_\_\_\_ ?  
i) idu ii) yavudu iii) entha iv) dura .
- (2) nivu ; nimma :: avaru ;  
i) adu ii) idara iii) avara iv) avaru
3. write the opposite of haLeya :  
i) hosa ii) doDDa iii) mara iv) avara
- (4) write the meaning of makkaLu  
i) we ii) our iii) children iv) kelasa
5. kempu :  
i) black ii) blue iii) red iv) start
6. Avanu nanna tangi correct the underlined word.  
i) avaLu ii) adu iii) ivara iv) nanna
- (7) garden :  
i) shaale ii) beDa iii) hege iv) tooTa
8. Tarakaari:  
i) batte ii) benDekayi iii) mara iv) neeli
9. nanna ; main : : niivu :  
i) we ii) mine iii) us iv) you
- (10). avanu-----oL Leyahu Duga .  
i) aa ii) jana iii) bahaLa iv) keTa

## PART -B UNIT - I

Write 8 sentence about yourself in Kannada ( using English letter ) CO1 (08)

# HSCP16K

2. Translate this sentence in to kannada: ( using English letter ) CO1 (08)
- i. What class do you have now ?
  - ii. I want a house for rent .
  - iii. my room is nearby.
  - iv. sure. I will come .
  - v. shall we go to library ?
  - vi. I like fruits.
  - vii. this is a good college.
  - viii. I know to speek kannada and hindi.

## UNIT - II

3. Answer the following words: (using English letter) CO2 (08)
- i. nimma matrubhaashe yaavudu ? nimma uuru yaavudu ?
  - ii. nimma hesaru eenu ? nimma tandeya hesaru eenu ?
  - iii. nimage yava yava bhashegaLu gothu ?
  - iv. Yavudaddaru eradu haNNu gaLa hesarannu bareiri?
  - v. kannadakke estu jnanapita pashastigaLu bandive ?
  - VI. Karnataka raajyada rajyadhi yavudu ? karnatakada modala hesaru eenu ?
  - VII. kannadakke estu jnanapita pashastigaLu bandive ?
  - VIII. Nimmage ista vada baNNa yaavudu?

4. Fill in the blanks ( using the correct equivalent words given in the box) CO2 (08)

- i. aa puTTave hesaru eenu ? ( book )
- ii. avana hesoru eenu ? ( name )
- iii. niivu elli \_\_\_\_\_ idira ? ( live )
- iv. BengaLuru \_\_\_\_\_ ide .( nice )
- v. naanu obba injiniiring vidhyamshi ( student )
- vi. naanu kannada\_\_\_\_\_ idini ( learing )
- vii. avaLu nanna sangi ( younger sister )
- viii. aa nanna angaDi (that )

## UNIT - III

5. Write English equivalents and make sentence for the following words:(using English letter ) CO1 (08)
- Rasayanashastra , uuta , keTTa, doDDa , yaavudu, chikka , hattu , aNNa.

6. Write the numbers name in kannada (using English letters ) CO1 (08)
- 78, 203, 450, 780, 643, 286, 390, 421.

## UNIT - IV

7. Rearrange the following and make a proper sentence. CO2 (08)
- i. barutteve naavu naLe bengaLurige.
  - ii. Yaavudu banna batheya ee.
  - iii. Hesaru tarakari benDekayyi ondu.
  - iv. seebhu nanage beeku hannu.
  - v. yagona beeti sayankala naavu.
  - vi. bandiddare vidyartigaLu taragatige liiga.
  - vii. kannada avanige baralla channagi.
  - viii. namma uuruge nale hoguttene naanu.

8. Write the opposite for the following and frame a sentence. CO1 (08)
- Hosa , oLLeya, doDDa, kaappu, kaappu, hattira, kathale, sarakari, baDige.

# HSCP16K

## UNIT - V

- |            |    |  |     |      |
|------------|----|--|-----|------|
| 9.         | a) | Write kannada Alphabets a to La in kannada.                | CO3 | (04) |
|            | b) | Write 4 sentence about kannadabhashe.                      | CO4 | (04) |
| <u>10.</u> | a) | kannada swarakshara mattu vyanjanasksharagalannu bareyiri. | CO3 | (04) |
|            | b) | Write 4 sentence about Karnataka state.                    | CO4 | (04) |

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- Ondu  
- Earu  
3 - muuru  
4 - naalke  
5 -  
6 - Aikku  
7 - eelu  
8 - Enthu  
9 - Umbhattu  
10 - Maathu

Onu  
Maali  
gpathu

# SEMESTER END EXAMINATIONS – MAY 2023

<b>Program</b>	<b>: B.E :- Common to CSE / ISE / CSE (CY) / AI &amp; DS / BT / AI &amp; ML / CSE (AI &amp; ML)</b>	<b>Semester</b> : I
<b>Course Name</b>	<b>: Engineering Physics</b>	<b>Max. Marks</b> : 100
<b>Course Code</b>	<b>: PYC12</b>	<b>Duration</b> : 3 Hrs

**Instructions to the Candidates:**

- Answer one full question from each unit.
- Physical constants:  $h=6.625 \times 10^{-34} \text{ Js}$ ;  $k=1.38 \times 10^{-23} \text{ J K}^{-1}$ ;  $m_e=9.1 \times 10^{-31} \text{ kg}$ ;  $\epsilon_0=8.852 \times 10^{-12} \text{ F m}^{-1}$ ;  $e=1.602 \times 10^{-19} \text{ C}$ ;  $N_A=6.023 \times 10^{26} / \text{k.mol}$ ;  $c=3 \times 10^8 \text{ ms}^{-1}$ .

### UNIT - I

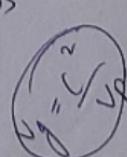
1. a) Explain the construction and working of He-Ne laser with relevant diagrams. CO1 (08)
- b) Explain intermodal dispersion and how is it reduced in a Graded Index multimode fibre. CO1 (07)
- c) Calculate the number of modes supported for  $82\mu\text{m}$  carrier wave by a multi-mode step index optical fiber of core diameter  $50\mu\text{m}$ , core refractive index 1.53 and fractional index change  $2.3 \times 10^{-3}$ . CO1 (05)
2. a) Explain interaction of radiation with matter and derive the expression for energy density at thermal equilibrium in terms of Einstein coefficients. Compare the expression with Planck's law. CO1 (08)
- b) What is attenuation in an optical fiber? Explain any three mechanisms leading to attenuation in an optical fiber. CO1 (07)
- c) For a light of frequency  $1.5 \times 10^{14} \text{ Hz}$  used as an excitation source at a temperature of  $300\text{K}$  find the ratio of stimulated to spontaneous emissions. CO1 (05)

### UNIT - II

3. a) Setup Schrodinger's time independent one dimensional wave equation. CO2 (08)  
What are the characteristics of a wave function.
- b) Define phase velocity and group velocity. Derive the expression for group velocity from superposition principle. CO2 (07)
- c) An electron has a speed of  $4.8 \times 10^5 \text{ m/s}$  accurate to 0.017 %. With what accuracy can be located the position of electron? CO2 (05)
4. a) Solve the Schrodinger wave equation for the Eigen energy values and Eigen functions in the case of a particle in an infinite potential well. CO2 (08)
- b) State Heisenberg uncertainty principle. Prove that an electron does not exist within a nucleus. CO2 (07)
- c) The ground state energy of electron in an infinite well is 37.64 eV. What will be the ground state energy value if the width of the well is doubled? CO2 (05)

### UNIT - III

5. a) Obtain an expression for the density of energy states in a metal. CO3 (08)
- b) Define Fermi factor. Explain the dependence of Fermi factor on temperature with the graph. CO3 (07)
- (c) The polarizability of an elemental solid dielectric material is  $7 \times 10^{-40} \text{ F m}^2$ . Assuming the internal field to be a Lorentz field, Calculate the material's dielectric constant if it has  $2 \times 10^{28} \text{ atoms/m}^3$ . CO3 (05)

$$\mu_2 A \sin \beta = 2 \cos$$


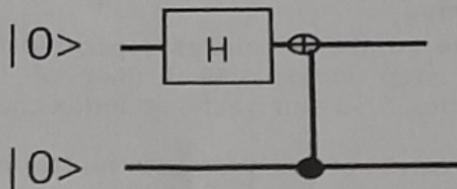
Page 1 of 2

# PYC12

6. a) Define the internal field. Derive an expression for internal field in a one-dimensional array of atoms in solids. CO3 (08)  
 b) Define critical temperature. Explain the Meissner effect. CO3 (07)  
 c) The Fermi energy of a metal is 5.5eV. Determine the value of energy for which the probability of occupation is 2 % at 350K. CO3 (05)

## UNIT- IV

7. a) With suitable diagram, explain the production and detection of circularly polarized light and elliptically polarized light. CO4 (08)  
 b) Explain single-particle quantum interference with a suitable example. CO4 (07)  
 c) Consider two states  $|\psi\rangle = |\phi_1\rangle + 3i|\phi_2\rangle - |\phi_3\rangle$  and  $|\chi\rangle = |\phi_1\rangle - i|\phi_2\rangle + 5i|\phi_3\rangle$  where  $|\phi_1\rangle, |\phi_2\rangle$  and  $|\phi_3\rangle$  are orthonormal. Are  $|\psi\rangle$  and  $|\chi\rangle$  normalized ? Justify your response. CO4 (05)
8. a) Explain the set up and theory of Stern-Gerlach experiment with suitable diagrams. CO4 (08)  
 b) What is a qubit? Explain how a Bloch sphere is used for the representation of qubits. CO4 (07)  
 c) Describe the action of a Hadamard gate and obtain the output of given quantum circuit. CO4 (05)



## UNIT - V

9. a) Discuss Poisson's probability distribution. Explain the probability of number of particles emitted per second by a radioactive source using this method. CO5 (08)  
 b) Explain as how physics of mechanics is involved in making a character jumping animation. CO5 (07)  
 c) A jumping animation sequence consists of six frames with pulse height 0.5m and stop height 0.6m. Calculate the stop time if the animation is played at 30fps. CO5 (05)
10. a) Discuss normal distribution and bell curve. Explain Maxwell Boltzmann distribution law. CO5 (08)  
 b) What is Monte-carlo simulation method? Discuss the steps involved in this method. CO5 (07)  
 c) How many frames exist in a sequence of animation which covers a total distance of 0.2m with base distance of 0.05m. CO5 (05)

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# SEMESTER END EXAMINATIONS - MAY 2023

Program	: B.E :- Common to CSE / ISE / CSE(CY) / AI & DS / BT / AI & ML / CSE (AI&ML) / CV	Semester : I
Course Name	: Communicative English	Max. Marks : 50
Course Code	: HSCP15	Duration : 2 Hrs

**Instructions to the Candidates:**

- **PART - A** : Answer all the questions, each question carries one mark.
- **PART - B** : Answer one full question from each unit.

**PART-A**

CO1- (10)  
CO5

1. Which of the following is desired for effective communication?
  - a) Redundancy
  - b) Clarity
  - c) Clichés
  - d) Circumlocution
  
2. Out of the following, which element is the medium through which messages are sent?
  - a) Sender
  - b) Channel
  - c) Context
  - d) Noise
  
3. How many syllables are there in the word PHOTOGRAPHER?
  - a) 3 syllabus
  - b) 4 syllabus
  - c) 5 syllabus
  - d) 6 syllabus
  
4. Identify the word with a different sound represented by two underlined letters at the final level in one of the following words.
  - a) Church
  - b) Each
  - c) Reach
  - d) Epoch
  
5. On Saturdays, I work from nine to five. (Identify the parts of speech for the underlined word)
  - a) Verb
  - b) Preposition
  - c) Adverb
  - d) Noun
  
6. I want to go to a university in the United States. (Identify the parts of speech for the underlined word)
  - a) adjective
  - b) preposition
  - c) noun
  - d) pronoun
  
7. I \_\_\_\_\_ working all afternoon and have just finished the assignment.
  - a) have been
  - b) had been
  - c) shall be
  - d) am
  
8. She denies \_\_\_\_\_ conduct in public office and late representation.
  - a) un
  - b) mis
  - c) uni
  - d) anti
  
9. \_\_\_\_\_ is mental image in which a speaker vividly pictures himself or herself giving a successful presentation.
  - a) Focusing
  - b) Visualization
  - c) Representation
  - d) Channelling
  
10. Reading is a \_\_\_\_\_ process.
  - a) Encoding
  - b) Listening
  - c) Decoding
  - d) Talking

**PART- B  
UNIT- I**

1. How would you describe effective communication? CO1 (08)

2. What role do facial expressions, gestures and pauses play in communication? CO1 (08)

**UNIT- II**

3. Differentiate between vowel and consonant sounds in the English Language. CO2 (08)

4. Why word stress and intonation are important in your conversation? CO2 (08)  
Illustrate with examples.

**UNIT- III**

5. Identify the parts of speech for the underlined words in the given passage. CO3 (08)

The term professional communication refers to the various forms of speaking, listening, writing, and responding carried out both in and beyond the workplace, whether in person or electronically. As Cheng and Kong said, "Professional communication is an emerging area of investigation in many disciplines such as applied linguistics, communication studies, education, and psychology. Professional communication develops information and supports contacts inside and outside of your workplace. Keep the lines of communication with your contacts open at all times. Understand that decisions in organizations are subject to change and revision.

6. Give the meaning and frame sentences for the following idioms. CO3 (08)

- i) In black and white      ii) Let the cat out of the bag  
iii) Lion's share      iv) A red letter day

**UNIT- IV**

7. a) How would Prefixes, and Suffixes, and Compound words help in forming words? Illustrate with suitable examples. CO4 (04)

b) Identify the tense for the given sentences. CO4 (04)

- i) What are you watching?  
ii) You aren't eating liverwurst, are you?  
iii) Did you have spaghetti for dinner last night?  
iv) Why didn't you wash the car yesterday?

a) Match the following with suffixes with the root word given below. CO4 (04)

A	B
1. Migrate	1. ment
2. Notice	2. ern
3. North	3. ion
4. Excite	4. Able

b) How do you enhance your vocabulary? Illustrate with examples. CO4 (04)

**UNIT- V**

8. Explain the features of an effective presentation. CO5 (08)

9. What are the rules do you follow for effective 'public speaking'? CO5 (08)

**SEMESTER END EXAMINATIONS – MAY 2023**

<b>Program</b>	<b>B.E :- Common to CSE / ISE / CSE(CY) / AI &amp; DS / BT / AI &amp; ML / CSE (AI&amp;ML) / CV</b>	<b>Semester</b>	<b>I</b>
<b>Course Name</b>	<b>A Scientific Approach to Health</b>	<b>Max. Marks</b>	<b>50</b>
<b>Course Code</b>	<b>AECP17</b>	<b>Duration</b>	<b>2 Hrs</b>

### **Instructions to the Candidates:**

- **PART A** : Answer all the questions.
  - **PART B** : Answer one full question from each unit.

## **PART - A**

- |  |  |      |
|--|--|------|
| 1. Positive attitude helps improve mental and _____ health of a person.                                      | CO1  | (01) |
| (a) Financial<br>(c) Physical  | (b) Moral<br>(d) Spiritual   |      |
| 2. Which choice below is NOT a practice of mindfulness?  | CO1  | (01) |
| (a) disconnection from all distractions including social media<br>(c) fantasizing and daydreaming            | (b) meditating yoga<br>(d) connecting with nature using your five senses   |      |
| 3. Which of the following factors is necessary for a healthy person?   | CO2  | (01) |
| (a) Vaccination<br>(c) Personal hygiene  | (b) Balanced diet<br>(d) All of the above  |      |
| 4. What are the benefits of positive thinking?   | CO2  | (01) |
| (a) Increased life span<br>(c) You are always happy  | (b) Lower rate of depression<br>(d) Less stress  |      |
| 5. Which food in the food pyramid should be eaten less?  | CO3  | (01) |
| (a) Fruits and vegetables<br>(e) Fats and oil  | (b) Meat, egg and nuts<br>(d) carbohydrates  |      |
| 6. Which of the followings activities is considered a healthy habit?   | CO3  | (01) |
| (a) have cereal with milk and fruits for breakfast<br>(c) play a video game every night                      | (b) sleep six hours a day<br>(d) watching TV all night   |      |
| 7. Chronic illnesses are?  | CO4  | (01) |
| (a) curable and immediate<br><del>(A) incurable and requires special assistance to manage</del>              | (b) treatable and does not interfere with one's everyday life<br>(d) interferes with the affected individual's long term functioning |      |
| 8. Place the following in the correct order of the stages of addiction                                       | CO4  | (01) |
| (a) Drug use ,dependance ,tolerance , addiction<br><del>(e) Drug use, tolerance, dependance, addiction</del> | (b) Dependance, tolerance , Drug use addiction<br>(d) Drug use, dependance, addiction , tolerance                                    |      |

# **AEC P17**

9. A student started using marijuana. He soon discovered that he needed more of the drug in order to experience the same effects or high. Which of the following has the student developed? CO5 (01)

- (a) Tolerance for marijuana (b) A mental illness  
(c) Withdrawal symptoms (d) Signs of recovery

10. Illegal drugs are dangerous to your health. What do you think are some other common features of illegal drugs? CO5 (01)

- (a) affects the function of the brain (b) can result in drug dependence and addiction  
(c) can improve focus and concentration (d) (a) and (b) are correct

## **PART - B**

### **UNIT - I**

1. a) What are the ways to foster positive thinking? Identify two most significant one and justify why it is important. CO1 (04)

b) Represent schematically the Pillars of wellness and justify how they influence each other. CO1 (04)

2. a) What are the 5 areas of wellbeing? CO1 (04)  
b) Do you agree in the statement "Building a healthy lifestyle for better future "If so" Explain with an example. CO1 (04)

### **UNIT - II**

#### **Case Study : Vijay & Shiv**

Vijay is 55 years old and about 30 pounds overweight. As a younger man he hiked with his father and brother, which he enjoyed very much. Unfortunately, his father died several years ago and his brother moved away after he married. Vijay was able to move into half of a two-bedroom apartment. He generally liked people and was always talking about wanting to go hiking again. When a new support person started working, Shiv, Vijay started telling him how much he wanted to go on some hikes. Shiv, the new support person, agreed to take him on a hike but only if Vijay could get into better shape. He also told him that it might take a few months, even if Vijay was really excited. Shiv knew that he had to get into shape also.

3. a) If You are given a task of explaining the food pyramid to students of class 5 to class 8 ,explain how you would bring out the need to adapt healthy eating. CO2 (04)  
b) Refer to the **Case Study: Vijay & Shiv** and answer the following questions: CO2 (04)  
(i) What are the behaviors that need to be changed by Vijay?  
(ii) Present a weekly dietary chart for Vijay to be followed for three months.  
(iii) Can the same chart be followed by Shiv ? Give reasons.

4. a) If you were to identify 4 Good Eating Habits to Achieve Your Health Goals , what would those be? List out and give one reason for choosing it. CO2 (04)  
b) Refer to the **Case Study: Vijay & Shiv** and answer the following questions: CO2 (04)  
(i) What health promotion actions would help Vijay to be ready for the hike?  
(ii) Present a weekly fitness activity chart for Vijay to be followed for three months  
(iii) Can the same chart be followed by Shiv? Reason out .

# AECP17

## UNIT - III

### Case Study : Anxious Mithun

Mithun has been waiting the queue in a railway ticket counter to buy a travel ticket. The queue is rather long and there are about 15 people in front of him. He has taken permission at work for 2 hours and has to report back. The chance of him reaching the counter before that is difficult.

- ✓ 5. a) Refer to the **Case Study: Anxious Mithun** and answer the following questions: CO3 (04)

At last Mithun finds a solution and was able to get the ticket in half an hour time.

(i) Could you relate to Mithun situation? What type of communication skill would have enabled him to achieve that? How? Explain.

- b) How do you justify that communication skills are important in student life? Illustrate. CO3 (04)

6. a) Refer to the **Case Study: Anxious Mithun** and answer the following questions: CO3 (04)

Assume you are in front of Mithun in the queue.

(i) Could you relate to Mithun situation? How would you address the situation and you help Mithun? If so, how? Explain.

- b) One way to make communication more effective is to choose the appropriate kind of communication based on the situations. Explain with a suitable example. CO3 (04)

## UNIT - IV

- ✓ 7. a) As a college student, choose 2 bad habits and the wise choices of breaking those bad habits among the current day youth. give reasons for your choice. CO4 (04)

- b) What are the physical and psychological effects of substance abuse on an individual? How does it affect society? CO4 (03)

- c) **Answer in a single sentence:** If you know something's bad for you, why can't you just stop? About 70% of smokers and alcoholics say they would like to quit. So why don't we do it? Why It's So Hard to Change? CO4 (01)

8. a) What substances are most often abused? CO4 (04)

Differentiate substance abuse and substance dependency with one example.

- b) What are the variables that influence substance abuse in the following category : CO4 (03)

(i) Drug factors (ii) history of trauma (iii) user factors (iv) environmental factors.

- c) **Answer in a single sentence:** If you know something's bad for you, why can't you just stop? Drug and alcohol abusers struggle to give up addictions that hurt their bodies and tear apart families and friendships. So why don't we do it? Why It's So Hard to Change? CO4 (01)

## UNIT - V

- ✓ 9. a) Why can coping with a chronic illness be so difficult? What are some effects of a chronic illness? CO5 (04)

- b) When should one seek help to cope with my chronic illness? If a person has a chronic illness, how can he/she make his/her life better? CO5 (04)

10. a) List and explain four steps to living well with a chronic illness and what are biggest risk factors for chronic disease in the society. CO5 (04)

- b) Identify and explain two Maladaptive measures of coping Strategies in Chronic Illness. CO5 (04)

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**Department of Computer Science and Engineering**

**Programme: B.E.**

**Course: Introduction to C++ Programming**

**CIE: Test II**

**Max Marks: 30**

**Sem: 01**

**Time: 1Hr**

(CS)

**Term: December 2022– March 2023**

**Course Code: PLC144**

**Date: 15/03/2023**

**Portions for Test: LP 12- 23**

**Instructions to Students:** **First question is compulsory.**

**Answer any one full question from 2 or 3.**

<b>Sl#</b>	<b>Question</b>	<b>Marks</b>	<b>Bloom's Level</b>	<b>Course Outcomes</b>
1) a	Describe how to perform read and write operations on a text file with example.	(5)	L3	CO4
b	Write a C++ program to demonstrate multilevel inheritance for the following: Suppose we have three classes Vehicle, FourWheeler, and Car. The class Vehicle is the base class, the class FourWheeler is derived from it and the class Car is derived from the class FourWheeler. Class Vehicle has a method 'vehicle' that prints 'I am a vehicle', class FourWheeler has a method 'fourWheeler' that prints 'I have four wheels', and class Car has a method 'car' that prints 'I am a car'.	(5)	L3	CO3
c	Define exception and list out its benefits.	(5)	L2	CO5
2) a	Define function overloading, write a C++ program to overload function for computing the area triangle, circle and square	(5)	L3	CO3
b	Illustrate the effect of accessibility while deriving a class using protected visibility mode.	(5)	L4	CO3
c	Describe formatting flags, bit field and setf (OR)	(5)	L2	CO4
3) a	Write a C++ program to swap 2 values by writing a function that uses call by reference technique.	(5)	L3	CO3
b	Explain the following functions related to file handling with example, getline( ), get( ), put( ) and write( )	(4)	L2	CO4
c	Write a C++ program that creates a Calculator class. The class contains two variables of integer type. Design a constructor that accepts two values as parameter and set those values. Design a method named Division( ) and an exception handler (ArithmaticException) in Division () method that throws an exception if the denominator is zero.	(6)	L3	CO5

Achieve code reusability and extensibility by means of Inheritance and Polymorphism.

CO4: Demonstrate C++ functions to perform operations on a file.

CO5: Illustrate the use of Exception handling feature in C++ for handling errors at runtime.