ACAD-27 a)	Shri Ramdeobaba College of Engineering and Management, Nagpur -440013	Iss. No.: 01, Rev. No.: 00
Ref. Clause(s): 9.1		Date of Rev: 01/01/2018
Department: Electronics & Communications	Semester : IV Shift: First and Second Course Code: ECT 256 Course Name: Analog & Digital Communication	Page: 01/01
Programme: B.E.	Test: 1	Date of Exam: 18/05/2022
Max Marks: 15	Session: 2021-2022	Time: 1 Hour

Instruction: All questions are compulsory

Q. No.		Marks	CO	EO
1	An AM signal has a peak unmodulated carrier voltage 100 V with resistance 50 Ohm. By considering modulation index 1, Estimate 1. The Carrier Power 2. Lower and Upper sideband Power 3. Total Sideband Power 4. Total Power of AM Signal 5. Sketch the AM Power Spectrum	05	CO 1	L2
2	Illustrate the effect of White Noise in Double sideband Suppressed Carrier (DSBSC) Communication system with block diagram and mathematical details.	05	CO 2	L3
3	The analog message signal is to be transmitted Using PCM with a maximum error 0.001. The signal has frequency of 100 Hz and amplitude range -10V to 10V. Calculate 1. Step Size 2. Number of bits in each PCM Sample 3. Signal to Noise ratio in dB 4. Bit rate 5. Transmission bandwidth.	05	CO 3	L3

ACAD-27 a)	Shri Ramdeobaba College of Engineering and Management,Nagpur -440013	Iss. No.: 01, Rev. No.: 00
Ref. Clause(s): 9.1		Date of Rev: 01/01/2018
Department: EC	Semester : 4th Shift: I/II Course Code: ECT257 Course Name: Analog Circuits	Page: 01/01
Programme: BE	**Test: 1**	Date of Exam: 19/05/2022
Max Marks: 15	Session: 2021-22	Time: 11:00 am – 12:00 noon

Question No.	Questions	Marks	CO	EO
	Derive the equations of input resistance for Voltage series and Current shunt feedback topologies.	8	CO1	L2
2(a)	For dual input balanced output differential amplifier, derive the equations for dc analysis and ac analysis.	5	CO4	L2
2(b)	The following specifications are given for single input unbalanced output: R_c=2.2KΩ, R_E=4.7 KΩ, $R_{in1}=R_{in2}$=50Ω, $\pm V_{cc}$= ±10V and the transistor is the CA3086 with $\beta_{ac}=\beta_{dc}$=100 and V_{BE}= 0.715V typical. Determine the I_{CQ} and V_{CEQ} values.	2	CO4	L2

Doc. No.: FY-ACAD-33(a)	**Shri Ramdeobaba College of Engineering and Management, Nagpur - 440 013**	**Iss. No.: 01** **Rev. No.: 00**
Clause No.: 9.1		**Date of Rev.: 01/01/2018**
Department: Physics	**Name of Internal Examination: TA-1** **Session: 2021-22 Semester: IV Sec-A&B** **[Electronics & Communication Engineering]**	**Page 1/1**
Course Code: PHT251 **Course Name: Introduction to Electromagnetic Field**		**Date of Submission: 26th April 2022** **Timing: 1o am to 11am**
Maximum Marks: 15		**Duration: 1Hr.**

CO-1

Q. No.	Question	Marks
1	Transform the vector $10\mathbf{a_x}$ to spherical coordinate at P (x = -3, y = 2, z = 4)	3
2	The vector from the origin to point A is given as $6\mathbf{a_x} - 2\mathbf{a_y} - 4\mathbf{a_z}$, and unit vector directed from the origin towards point B is (2/3, -2/3, 1/3). If points A and B are 10 unit apart, find coordinates of point B.	4
3	Find the normal vector to the surface defined in $2x^2y - 5z$ at point P (-4, 3, 6).	3
4	A certain radiating antenna has radiation field $2\rho\cos^2\varphi - \rho \sin^2\varphi$. Find the radial part of field.	2
5	Find a) Vector G from origin to the midpoint of line joining A(2, -3,5) and B (6, -5,5). b) The vector C (-2,7,3) is given. Find the vector component of R_{AB} in the direction of R_{AC}.	3

Teacher: P R Gandhi & R.A. Nafdey

ACAD-27 a)	Shri Ramdeobaba College of Engineering and Management,Nagpur -440013	Iss. No.: 01, Rev. No.: 00
Ref. Clause(s): 9.1		Date of Rev: 01/01/2018
Department: EC	Semester : IV Shift: A & B Course Code: ECT258 Course Name: Microprocessors	Page: 01/01
Programme: BE	Test: 1	Date of Exam: 17/05/22
Max Marks: 15	Session: 2021-22	Time: 1 hour

Instructions:

1. **All questions are compulsory and carry marks as indicated.**
2. **Use of scientific calculator is allowed.**
3. **Assume suitable data where ever required.**

Question No.	Questions	Marks	CO	EO
Q1	Remember and draw neat pin diagram and explain HOLD and status signal pins.	3	CO1	L1
Q2	Illustrate Implicit addressing mode and indirect addressing mode with examples	3	CO1	L2
Q3	Clarify how an instruction is fetched and executed with an example.	3	CO1	L2
Q4	Use the knowledge of assembly language and write program to multiply two immediate bytes of data.	3	CO2	L3
Q5	Use the knowledge of assembly language and write program to convert the data byte to its Binary coded decimal representation and store the result as two separate nibbles.	3	CO2	L3

Doc. No.: FY-ACAD-33(a)	Shri Ramdeobaba College of Engineering and Management, Nagpur - 440 013	Iss. No.: 01 Rev. No.: 00
Clause No.: 9.1		Date of Rev.: 01/01/2018
Department: Physics	Name of Internal Examination: Test-1 Session: 2020-21 Semester: IV [Electronics and Communication Engineering] Sec-A&B	Page 1/1
Course Code: PHT251 Course Name: Introduction to Electromagnetic Theory		Date of Exam: 17-5-2022 Timing:11.00 am to 12.00 noon
Maximum Marks: 15		Duration: 1 Hrs

Note: 1] Assume suitable data wherever needed.

2] Neat and labelled diagram carry complete weightage.

Q. No.	Question	Marks	CO	EO
1	A person seating in the air plane measures the field at point - ($r = 5, \theta = 20^\circ, \varphi = -70^\circ$). What is its equivalent point in cartesian system?	1	1	. 2
2	The line charge density $\rho_L = 24\ Y^2$ m C/m is confined to y-axis. Find the total charge distributed on the y-axis when y = -5 to y = +5	2	2	2
3	What is scale factor? Obtain the scale factor for coordinate φ angle in spherical system.	2	1	1
4	Determine the equivalent vector field in spherical system for given vector $\mathbf{A} = 10\ \mathbf{a}_x$, at point P(x=-3, y=2, z=4).	3	1	5
5	Certain charge distribution has flux density - $\mathbf{D} = 8xyz^4\ \mathbf{a}_x + 16\ x^2z^4\ \mathbf{a}_y + 16\ x^2yz^3\ \mathbf{a}_z$ pC/m^2. Find the volume charge density emitting the above flux.	3	2	4, 5
6	Solve the either side of divergence theorem for the surface bounded with $0 \le \rho \le 3$, $0 \le z \le 2$ radiating the $\mathbf{D} = 20\rho^2\ \mathbf{a}_\rho$ nC/m^2 flux and hence obtain the charge enclosed by the closed surface.	4	2	4, 5

Teacher: R.A. Nafdey & P R Gandhi

ACAD-27 a)	Shri Ramdeobaba College of Engineering and Management,Nagpur - 440013	Iss. No.: 01, Rev. No.: 00
Ref. Clause(s): 9.1		Date of Rev: 01/01/2018
Department: EC	Semester : IV Section: A & B Course Code: ECT259 Course: Probability Theory & Stochastic Processes	Page: 01/01
Programme: BE (EC)	Class Test: 1	Date of Exam: 20-05-2022
Max Marks: 15	Session: 2021-22	Time: (1 Hr) 11.00 am-12.00 noon

Que No.	Questions	Marks	CO	EO
Q. 1	A town has two doctors X and Y operating independently. If the probability that doctor X is available is 0.9 and that for Y is 0.8, what is the probability that at least one doctor is available when needed? = 0.98	2	CO1	L2
Q. 2	The odds that a movie will be favourably reviewed by three independent critics are 5 to 2, 4 to 3 and 3 to 4 respectively. What is the probability that of the three reviews, a majority will be favourable? $= \frac{209}{343} = 0.6093$	2	CO1	L2
Q. 3	The chances of A, B and C becoming the General Manager of a company are in the ratio 4 : 2 : 3. The probabilities that the bonus scheme will be introduced in the company if A, B and C become General Manager are 0.3, 0.7 and 0.8 respectively. If the bonus scheme has been introduced, what is the probability that A has been appointed as General Manager? = 6/25 = 0.24	4	CO5	L4
Q. 4	A R.V. X has the PDF $f(x) = \begin{cases} 2x, & 0 < x < 1 \\ 0, & otherwise \end{cases}$ Compute i) E[X] = 2/3 ii) $P\left(X > \frac{3}{4} / X > \frac{1}{2}\right)$ = 7/12 = 0.5833	2	CO5	L3
Q. 5	If X and Y are two random variables with joint PMF as $P(x,y) = k(2x+3y), \quad x = 0,1,2. \ and \ y = 1,2,3.$ Evaluate the marginal and conditional distributions for a) $P(X=2, Y \le 2)$ = 17/72 = 0.2361 b) $P(X \le 1 / Y \le 2)$ = 22/39 = 0.5641 c) $P(X=0 / Y=2)$ = 1/4 = 0.25	3	CO5	L5
Q. 6	The probability of man hitting a target is $\frac{1}{4}$. Deduce the probability of hitting the target exactly twice, if he fires 7 times. = 0.31146	2	CO5	L3

Doc. No.: ACAD-27(a)	Shri Ramdeobaba College of Engineering and Management, Nagpur - 440 013	Iss. No.: 01 Rev. No.: 00
Clause No.: 9.1		Date of Rev.: 01/01/2018
Department: Physics	Name of Internal Examination: Test-2 Session: 2020-21 Semester: IV [Electronics and Communication Engineering] Sec-A&B	Page 1/1

Course Code: PHT251 Course Name: Introduction to Electromagnetic Theory	Date of Exam: 13-7-2022 Timing:12.00 pm to 1.00 pm
Maximum Marks: 15	Duration: 1 Hrs

Note: 1] Assume suitable data wherever needed.

2] Neat and labelled diagram carry complete weightage.

3] Attempt Q.no. 1 OR 2, Q. no. 3 OR 4, Q. no. 5 OR 6. Q no 7 OR 8

Q. No.	Question	Marks	CO	EO
1	A current carrying element $IdL = 10^{-4}$ (4, −3, 1) A.m is at point C (5, −2, 3) produces a field dH at P (4, −1, 2). a) Specify the direction of dH by a unit vector a_H b) Find |dH|.	4	3	2
2	Let $\varepsilon = 10^{-5}$ F/m, $\mu = 4x10^{-9}$ H/m, and $\rho_v = 0$, $\sigma = 0$. Find 'k', so that each pair of fields satisfies Maxwell's equations: (a) $H = 6\,a_x - 2y\,a_y + 2z\,a_z$ A/m, $D = kx\,a_x + 10y\,a_y - 25z\,a_z$ nC/m^2 (b) $H = (20y+kt)\,a_x$ A/m.s , $E = (y+2x\,10^6\,t)\,a_z$ V/(m.s)	4	3	3
3	Explain how EM wave is a uniform plane wave.	3	4	1
4	The magnetic field intensity is given in a certain region of space $H = \frac{x+2y}{x^2}\,a_y + \frac{2}{x}a_z$ A/m a) Find Curl of H for this field. b) Find J at point P (1,1,1).	3	4	2
5	Three current sheets $1.5\pi\,a_y$ A/m at x=6mm, $-3\pi\,a_y$ A/m at x=9mm and $1.5\pi\,a_y$ at x= -12mm. Find the magnetic field strength H at origin.	3	4	3
6	State Ampere circuital law and give its significance.	3	3	1
7	State what is phasor and Derive vector Helmholtz Equation for conducting medium?	5	4	2
8	Give the significance of displacement current with reference to propagations of ac field through capacitor.	5	3	2

Teacher: R A Nafdey & P R Gandhi

ACAD-27 a)		
Ref. Clause(s): 9.1	Shri Ramdeobaba College of Engineering and Management, Nagpur -440013	Iss. No.: 01, Rev. No.: 00
Department: Electronics & Communications	Semester : IV Shift: Second Course Code: ECT 256 Course Name: Analog & Digital Communication	Date of Rev: 01/01/2018
Programme: B.E.	Test: 2	Page: 01/01
Max Marks: 15	Session: 2021-2022	Time: 1 Hour	Date of Exam: 14/07/2022

Instruction: All questions are compulsory

Q. No.		Marks	CO	EO
1	A Convolution Code is described by X1=[1 0 1]; X2=[1 1 1]; If the received sequence for above encoder is 100111, decode the sequence using Viterbi decoding algorithm.	05	CO4	L4
2	Draw the block diagram for QPSK Transmitter. Sketch waveforms for QPSK Transmitter output if input is 10010110	05	CO4	L2,L3
3	Derive an expression for Signal to Noise Ratio and Probability of error for Phase shift keying.	05	CO5	L2

ACAD-27 a)	Shri Ramdeobaba College of Engineering and Management, Nagpur -440013	Iss. No.: 01, Rev. No.: 00
Ref. Clause(s): 9.1		Date of Rev: 01/01/2018
Department: EC	Semester : IV Section : A & B Course Code:ECT258 Course Name: Microprocessors	Page: 01/01
Programme: BE	**Test: 2**	Date of Exam: 13/07/2022
Max Marks: 15	Session: 2021-22	Time 3:00 to 4 :00 pm (1 hour)

Instructions:

1) **ALL QUESTION CARRY MARKS AS INDICATED**
2) **ALL QUESTIONS ARE COMPULSORY**

Question No.	Questions	Marks	CO	EO
Q.1	Organize the instruction STA 9000h by drawing the timing diagram and explain it in detail.	05	CO3	L3
Q.2	Interface a common cathode seven segment display to the microprocessor at port address E0H. Write a program to count from 0 to 9 with a delay of 0.5sec between each count. Display the count on the seven segment display.	06	CO3,4	L4
Q3.	Explain addressing modes of 8086 with examples.	04	CO2	L2

ACAD-27 a)	Shri Ramdeobaba College of Engineering and Management,Nagpur -440013	Iss. No.: 01, Rev. No.: 00
Ref. Clause(s): 9.1		Date of Rev: 01/01/2018
Department: EC	Semester : 4th Shift: I/II Course Code: ECT257 Course Name: Analog Circuits	Page: 01/01
Programme: BE	**Test: 2**	Date of Exam: 15/07/2022
Max Marks: 15	Session: 2021-22	Time: 12:00 noon – 1:00 pm

Note: Solve any three

Question No.	Questions	Marks	CO	EO
1	For Schmitt trigger circuit, determine threshold voltages V_{UT} and V_{LT}. Draw the hysteresis curve. Assume saturation voltage of ±12 V, R_1 = 2 kΩ and R_2 = 4 kΩ. Derive the necessary expression used.	05	CO4	L2
2	Design a MMV using IC 555 with tp = 250 ms. Sketch the expected output waveform when external trigger is applied.	05	CO5	L3
3	Explain the class A transformer coupled power amplifier with the help of neat circuit diagram. Derive its efficiency.	05	CO3	L2
4	Derive the formula of frequency of operation of Colpitt oscillator.	05	CO3	L2

ACAD-27 a)	Shri Ramdeobaba College of Engineering and Management, Nagpur -13	Iss. No.: 01, Rev. No.:
Ref. Clause(s): 9.1		Date of Rev: 01/01/2(
Department: ECE	Semester : IV Section: A and B Course Code: ECT 259 Course Name: Probability Theory and Stochastic Processes	Page: 01/01
Programme: B. Tech.	Test: 2	Date of Exam: 16/07/2022
Max Marks:15	Session: 2021-22	Time: 1HOUR

Instructions: **1. Each Question carries marks as indicated.**
2. Assume suitable data wherever necessary.
3. Use of standard normal distribution table is permitted.
4. All questions are compulsory.

Que No.	Description	Marks	COs Mapped
Q.1	Suppose that number of customers visiting an ice-cream shop is a random variable with mean 40. Calculate the probability that number of customers visiting the shop will exceed 60.	2	CO1, CO5
Q. 2	Computers from a particular company are found to last on an average for 3 years without any hardware malfunction with standard deviation of two months. At least what percentage of the computers will last between 31 months and 41 months?	2	CO1, CO3
Q. 3	Consider a Random Process $\{ X(t), t \in R \}$ defined as $X(t) = A \cos(w_o t + \phi)$, where ϕ is Uniformly distributed i. e. $\phi \sim U(0, 2\pi)$. A and w_o are constants. Compute **Mean of X(t)**	2	CO2, CO4
Q. 4	A normally distributed IQ score have a mean of 100 and standard deviation of 15. Use the standard Z-table to answer following questions: What is the probability of randomly selecting someone with an IQ score a) less than 80 b) greater than 136 c) between 95 and 110	3	CO3, CO5
Q.5	A certain group of welfare recipients receives SNAP benefits of $110 per week with a standard deviation of $20. If a random sample of 25 people is taken, Using CLT, find the probability that their mean benefit will be greater than $120 per week?	2	CO3, CO5
Q.6	A random process X(t) having auto-correlation function $R_{XX}(\tau) = e^{-4\|\tau\|}$ is applied as input to the LTI system with impulse response $h(t) = e^{-2t} u(t)$. Find the PSD $S_{YY}(\omega)$ of output Y(t).	4	CO4