27 a) / Clause(s): 9.1	Shri Ramdeobaba College of Engineering and Management,Nagpur -440013	Iss. No.: 01, Rev. No.: 00
Department: EC	Semester : VI Shift: Course Code: IDT353 Course Name: BIOLOGY FOR ENGINEERS	Date of Rev: 01/01/2018
Programme: B Tech	Test: 1	Page: 01/01
Max Marks: 15	Session: 2022-23	Date of Exam: 23/03/2023
		Time: 12 PM to 1 PM

Instructions: 1. Solve Any THREE questions.
2. Draw suitable figure wherever necessary.

Question No.	Questions	Marks	CO	EO
1	Why should engineer know the biology? Explain with the example.	5	CO1	
2	Explain the Biological Nomenclature and Hierarchy of classification of life forms. Explain with any biological example.	5	CO1	
3	Discuss the term anatomy. Explain the anatomy of human vertebral column in detail.	5	CO1	
4	Discuss the term physiology. Explain the human respiratory system in detail.	5	CO1	

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 : VI Shift: Course Code: IDT353 Course Name: Biology for Engineers	Page: 01/01
Programme: B Tech	Test: 2	Date of Exam:
Max Marks: 15	Session: 2022-23	Time: 1 Hrs

Instructions: 1. Solve all the questions
2. Draw the suitable diagram wherever necessary.

Question No.	Questions	Marks	CO	EO
1	Discuss the term metabolism in detail. **OR** Discuss the process of glycolysis and glycolysis pathways in detail.	3	CO3	L3
2	Differentiate the DNA and RNA in detail. **OR** Discuss the process of DNA replication in detail.	3	CO2	L4
3	Explain the term gene expression and regulation of gene expression in detail. **OR** Explain the properties of the genetic codes in details.	3	CO4	L2
4	Write a short note on Biomedical signals. Explain the ECG in detail.	3	CO5	L2
5	Explain the term biosensors and its application in detail.	3	CO6	L4

D-27 a)	Shri Ramdeobaba College of Engineering & Management, Nagpur -440013		Iss. No.: 01, Rev. No.: 00
Department: EC	Semester: VI		Page: 01/01
Program: B.Tech.	Course Code: ECT359-3	Course Name: Biomedical Electronics	Date of Rev: 01/01/201
Max Marks: 15	TEST 1		Date of Exam: 23/03/2
Instructions:	Session: 2022-23 (Even Semester)		Time: 1Hour
	All questions are compulsory carry marks as indicated.		

Q. No.	Questions	Marks	CO	
Q1	Describe any two methods/ techniques of human blood pressure measurement with necessary block diagrams and mentions their advantages/ disadvantages if any.	05	CO4	
Q2	i) What do you mean by bio-telemetry? ii) Which type of modulation system is used in a multichannel bio telemetry system? iii) Draw and briefly elaborate the single channel telemetry system suitable for transmission of an ECG signal. iv) Mention any 2 problems associated with implant telemetry. sensor plac Battery life	06	CO4 CO5	
Q3	i) Define characteristic impedance in ultrasound imaging. ii) Why a coupling medium is essential when using ultrasound for diagnostic purpose imaging? iii) What is the frequency range of ultrasound normally used in medical field for diagnostic applications? iv) What are the any two advantages of an ultrasound imaging system?	04	CO3	L

① determines how sound waves propogate through a medium. It is measure of residence and stiffness of medium to sound waves $Z = \rho c$

② - sound transmission - Patient Comfort
- Reflection Reduction
- elimination of Air Artifacts
- enhanced contact

③ 2 to 18 MHz

④ Non-invasive &
- Real time imaging

ACAD-27 a)	Shri Ramdeobaba College of Engineering & Management, Nagpur -440013		Iss. No.: 01, Rev. No.: 00
			Page: 01/01
Department: EC	Semester: VI Course Code: ECT359-3	Course Name: Biomedical Electronics	Date of Rev: 01/01/2018
Program: B.Tech.	TEST 1		Date of Exam: 23/03/2023
Max Marks: 15	Session: 2022-23 (Even Semester)		Time: 1Hour
Instructions:	All questions are compulsory carry marks as indicated.		

Q. No.	Questions	Marks	CO
Q1	Summarize and briefly elaborate the any three types of electrodes used in bio-potential measurement with their applications.	03	CO2
Q2	Describe the origin of bioelectric signals. Draw a typical cell potential waveform, label it properly and explain the phenomena of depolarization and repolarization	04	CO2
Q3	Illustrate with the help of a block diagram a generalized medical instrumentation system with supporting example.	04	CO1
Q4	Describe the cardiovascular system in brief. Name the four valves associated with the functioning of the heart and describe their function.	04	CO1

① Tricuspid – betn RA & RV
② Pulmonary – B et RV & PA
③ Mitral – LA & LV
④ Aortic – Betn LV & aorta

of residence and stiffness of medium to sound
Z = ρc
- elimination of Air Artifacts
- enhanced contact
④ Non-invasive & safe
- Real time imaging

U12 → Bus buffers, State table, Cache memory.

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 : VI Shift: I and II Course Code: ECT 356 Course Name: Computer Architecture	Page: 01/01
Programme: B Tech	**Test: 1**	Date of Exam: 18-03-2023
Max Marks: 15	Session: 2022-23	Time: 12-1 pm

Instructions:
All Questions are compulsory
Illustrate using neat block diagrams wherever necessary.

Question No.	Questions	Marks	CO	EO
1	Design and implement the binary to Excess-3 code converter using PAL. (•) $W = A+BC+BD$, $X = \overline{B}C+B\overline{D}+B\overline{C}D$, $Y = CD+C\overline{D}$, $Z = \overline{D}$	5	4	6
2	Perform Booth Multiplication algorithm on (29)10 and (-79)10.	5	1	3
3	Registers R4 and R5 contain the decimal numbers 2000 and 3000 before each of the following addressing modes is used to access a memory operand. What is the effective address (EA) in each case? (a) 12(R4), (b) (R4,R5), (c) 28(R4,R5), (d) (R4)+ (e) −(R4)	5	3	2

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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 : VIShift: I+II Course Code: ECT357 Course Name: Computer Networks	Page: 01/01
Programme: B.Tech.	Test: 1 / ~~2 / 3~~	Date of Exam: 20/03/2023
Max Marks: 15	Session: 2022-23	Time: 12.00 AM-01.00 PM

COs:

1. Understand computer networks and reference models.
2. Identify components of computer networks, multiple access, switching and routing techniques.
3. Comprehend the concepts of network security, layer services and protocols
4. Analyze error, flow and congestion control techniques, associated protocols and LAN standards
5. Design a network using addressing mechanisms.

Instructions:
All questions are compulsory.

Question No.	Questions	Marks	CO	EO
~~1~~	Dialog control and synchronization are two responsibilities of the session layer in the OSI model. Which layer do you think is responsible for these duties in the TCP/IP model? Explain your answer. Application layer	5	1	L3
2a	In your opinion, what is the role of the address field in a packet traveling through a datagram network?	3	2	L2
~~2b~~	What is the significance of the twisting in twisted-pair cable?	2	2	L2
~~3a~~	A pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the requirement to make this frame collision-free? 1ms. 2x1ms = 2ms	3	2	L5
~~3b~~	Compare and contrast methodology used in random access protocol with that of channelizing protocol.	2	2	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 : VI Course Code: ECT357 Course Name: Computer Networks	Page: 01/01
Programme: B.Tech.	**Test: 2**	Date of Exam: 15/05/2023
Max Marks: 15	Session: 2022-23	Time: 12.00 AM-01.00 PM

COs:

1. Understand computer networks and reference models.
2. Identify components of computer networks, multiple access, switching and routing techniques.
3. Comprehend the concepts of network security, layer services and protocols
4. Analyze error, flow and congestion control techniques, associated protocols and LAN standards
5. Design a network using addressing mechanisms.

Instructions:
All questions are compulsory.

Question No.	Questions	Marks	CO	EO
1	Design a network for an organization using IPv4 addressing mechanisms. The ISP has granted a block 211.17.180.0/24 to the organization. The administrator wants to create THREE SUBNETS. Find the first and last address of 1st subnet. Find the first and last address of 3rd subnet.	5	5	L6
2	How congestion control is addressed by traffic shaping? Illustrate any one algorithm to shape traffic. → leaky bucket	5	4	L4
3	Using d = 37, and n = 77 in the RSA algorithm, calculate public key (n, e) and encrypt the message "FINE" using the values of 00 to 25 for letters A to Z. For simplicity, do the encryption and decryption character by character.	5	3	L6

1)
255.255.255.0 → original subnet mask
By borrowing 2 bits → 255.255.255.192
1 → 1 = 211.17.180.1
Last = 211.17.180.62
2 → 1 = .65
L = .126
3 - 1 = .129
L = .190

2)
n = 77
p = 7, q = 11
z = (p-1)(q-1)
z = 60
d|z| = e
37|60| = 13
Pub(K, e) = (77, 13)
$C = M^e \pmod n$
F → 5 ⇒ $13 \pmod{77}$
I - 8|77|
N - 62|77|
E - 4|77

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 and Communication	Semester: VI Shift: - Course Code: CST364 Course Name: Object Oriented Data Structure	Page: 01/02
Programme: B. Tech.	Test: 1	Date of Exam: 21/03/2023
Max Marks: 15	Session: 2022-23	Time: 1 hour

Instructions:

1. Assume suitable data wherever necessary.

Ques. No.	Questions	Marks	COs Mapped	EOs

Q.1(a)	Justify and write the output for the following codes:
	
	(i) class Ternary
	{
	public static void main(String args[])
	{
	int x = 3;int z;
	int y = ~ x;
	z = x > y? x : y;
	System.out.print(z);
	}
	}
	
	(ii) class Increment
	{
	public static void main(String args[])
	{
	byte b = 0b00000101;
	System.out.print(b + ",");
	b = (byte)~b;
	System.out.print(b);
	}
	}
		02	CO1	L3

Q.1(b)	Differentiate between Procedural Oriented Programming and Object Oriented Programming based on six different parameters.	03	CO1	L2
Q.2(a)	Illustrate the concept of method overloading by calculating the area of sphere and trapezium. [Area of sphere is = $4\pi r^2$] [Area of trapezium is = a+b/2 *h]	02	CO1	L3

Q.2(b)	Create a class **Toy** with data members as toyname, category and cost. Include a method set_data ( ) to input above information of Toy class and method display data ( ) to print the information of entered values. Also include a method print_cost( ) to display the information of toys having cost greater than Rs.1000.Write a complete Java program to test the class.[Use array of Objects]	03	CO2	L3
Q.3(a)	Illustrate the use of default (non-paramerized) constructor in multilevel inheritance with example. Which constructor will be called first and why???	02	CO2	L3
Q.3(b)	Consider the three classes as **Students, Test and Result** i. Identify the type of inheritance relationship among these classes. multiple ii. Define and create classes to appropriately represent class hierarchy. iii. Assume suitable methods and instance variables to calculate and print the result of a particular student.	03	CO2	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: Electronics and Communication	Semester: VI Course Code: CST364 Course Name: Object Oriented Data Structure	Shift: -	Page: 01/02
Programme: B. Tech.	Test: 2		Date of Exam: 13/05/2023
Max Marks: 15	Session: 2022-23	Time: 1 hour	

Instructions:

1. Assume suitable data wherever necessary.

Ques. No.	Questions	Marks	COs Mapped	EOs

Q.1(a)	1. Find the time complexity of following code:
	
	`import java.io.*;`
	`class GFG`
	`{`
	`  public static int sum(int a, int b)`
	`  {`
	`  return a + b;`
	`  }`
	`  public static void main(String args[ ])`
	`  {`
	`  int a = 5, b = 6;`
	`  System.out.println(sum(a, b));`
	`  }`
	`}`
	
	2. Prove that the running time T(n) = n 3 + 20n + 1 is O(n 3)
		02	CO3	L4

Q.1(b)	Consider the following infix expression Q: Q: ((A+B)*D)^(E-F) Convert Q into its equivalent postfix expression P using stack[Show all the steps of conversion using stack] Also write an algorithm to convert Infix to Postfix expression. → Scan all symbol L to R → Read symbol is an operand then append to postfix → (; push →) – pop . → I/p over pop remaining symbol & append to postfix.	01+02	CO3, CO4	L5