

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
FIRST SEMESTER
CALCULUS FOR ENGINEERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

1

Prove that at the point $x = \frac{\pi}{2}$ of the curve $y = 4 \sin x - \sin 2x$, $\rho = \frac{5\sqrt{5}}{4}$

2

Write the formula for the centre of curvature.

3

Write the sufficient conditions for a maximum (or) minimum.

4

Find $\frac{du}{dt}$ if $u = x^2 + y^2$, $x = at^2$, $y = 2at$.

5

Evaluate $\int x \sin x dx$

6

Evaluate $\int \frac{dx}{(x+2)^2 - 4}$

7

Evaluate $\int_0^a \int_0^{\sqrt{a^2-x^2}} dx dy$

8

Evaluate $\int_0^1 \int_1^2 x(x+y) dy dx$.

9

Find the unit vector normal to the surface $x^2 - y^2 + z = 2$ at the point $(1, -1, 2)$

10

State Green's theorem in plane

PART-B (5 x 16 = 80)

11 a.

Find the equation to the circle of curvature of the curve $xy = c^2$ at (c, c) **OR**

(P.T.O)

- b. Find the radius of curvature at the point θ on $x = 3a \cos \theta - a \cos 3\theta$ and $y = 3a \sin \theta - a \sin 3\theta$

- 12 a. (i) If $u = \sin^{-1} \frac{x}{y} + \tan^{-1} \frac{x}{y}$, then find the value of $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$
 (ii) Find $\frac{du}{dt}$ as a total derivative and verify the result by the direct substitution of $u = x^2 + y^2 + z^2$ when $x = e^{2t}$, $y = e^{2t} \cos 3t$, and $z = e^{2t} \sin 3t$

OR

- b. Find the maximum or minimum value of $f(x, y) = 2 + 2x + 2y - x^2 - y^2$

- 13 a. (i) Evaluate $\int \sqrt{x^2 - 2x - 3} dx$
 (ii) Show that $\int_2^3 \sqrt{(x-2)(3-x)} dx = \frac{\pi}{8}$

OR

- b. (i) Evaluate $\int x \tan^{-1} x dx$
 (ii) Evaluate $\int \frac{e^x(1 + \sin x)}{1 + \cos x} dx$

- 14 a. Evaluate $\int_0^a \int_0^{\sqrt{a^2-x^2}} \int_0^{\sqrt{a^2-x^2-y^2}} \frac{dz dy dx}{\sqrt{a^2-x^2-y^2-z^2}}$

OR

- b. Evaluate $\iint_R r^2 \sin \theta dr d\theta$, Where R is the region above the initial line of the curve $r = 2a \cos \theta$.

- 15 a. Verify Stoke's theorem for $\vec{F} = (x^2 + y^2)\vec{i} - 2xy\vec{j}$ taken around the rectangle bounded by the lines $x = \pm a$, $y = 0$, $y = b$

OR

- b. Evaluate $\iint_S \vec{F} \cdot \hat{n} ds$ where $\vec{F} = z\vec{i} + x\vec{j} - y^2z\vec{k}$ and S is the part of the surface of the cylinder $x^2 + y^2 = 1$ included in the first octant between the planes $z = 0$ and $z = 2$

Sl.No. 1981

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
FIRST SEMESTER
PHYSICS FOR ENGINEERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Give the examples for elastic bodies.
- 2 Define: bulk modulus of elasticity
- 3 Give the no. of atoms per unit cell and coordination number for FCC
- 4 What are Miller indices?
- 5 Define: Spontaneous emission
- 6 Write any two applications of CO₂ laser.
- 7 What is meant by critical angle?
- 8 What is multimode fiber?
- 9 What is destructive testing?
- 10 Give the demerits of Liquid Penetrant method.

PART-B (5 x 16 = 80)

- 11 a. Describe an experiment to determine Young's modulus of a beam by uniform bending.

OR

- b. Explain about I-shaped girders with neat diagram.

- 12 a. Determine the number of atoms per unit cell, coordination number, atomic radius and packing factor for BCC structure.

OR

- b. What are Miller indices? Write down the procedure finding the Miller indices with examples.

- 13 a. Explain the applications of lasers in scientific, engineering and industrial fields.

OR

- b. Describe the applications of laser in communication, military and chemical fields.

- 14 a. Describe the characteristics, advantages, disadvantages and applications step-index multimode fibre with necessary diagrams.

OR

- b. Write a note on the following
 i)critical angle, ii) total internal reflection, iii) acceptance angle, iv) numerical aperture.

- 15 a. write down the principle, advantages, disadvantages and applications of ultrasonic flaw detector

OR

- b. Describe the X-ray fluoroscopy technique of nondestructive testing.

**VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)**

B.E DEGREE EXAMINATIONS – NOV/DEC -2018

COMMON TO ALL BRANCHES

First Semester

ENGLISH FOR ENGINEERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time: Three hours

Maximum:100Marks

Answer **ALL** questions

PART – A (10 x 2 = 20 marks)

1. **Identify the parts of speech for the underlined words.**
 - i) We must help ourselves
 - ii) Oh! we are late for the movie

2. **Correct the following sentences by identifying the errors.**
 - i) Do the roses in your garden smell more sweetly than the roses in ours?
 - ii) If you lend him a book, he will lend it to some one else and never you will get it back.

3. **Define the following definitions.**
 - i) Acid ii) Calculator.

4. **Fill in the blanks with suitable articles.**
 - i) I live in ----- apartment
 - ii) I saw ---- movie last night.

5. **Identify the silent letters for the given words.**
 - i) Psychology ii) Doubt

6. **Choose the correct homonyms for the following.**
 - i) The burning candle created a pleasant ____ in the room. Sent, cent, scent.
 - ii) Would you like a piece of fruit? Perhaps a ____? Pear, pair, pare

7. **Choose the correct homophones for the following.**
 - i) She held the ____ in her hand. Reigns, rains, reins
 - ii) He was a medieval _____. Night, knight

8. **Fill in the blanks with appropriate tense form of the verbs.**

SIMPLE PRESENT TENSE

 - i) Every twelve months, the Earth _____ (circle) the Sun.
 - ii) This delicious chocolate_____ (be) made by a small chocolaty in Zurich, Switzerland.

9. Change the following sentences into impersonal passive voice.

- i) The N. S. S. students will clean our campus.
- ii) We can alter the characteristics of steel in various ways.

10. Complete the following sentence:

- i) If there had been no rains last month, _____.
- ii) If he studied hard, _____

PART – B (5 x 16 = 80 marks)

11. a) What are the characteristics of a good listener?

OR

b) State the importance of pronunciation with its guidelines

12. a) What are the points to remember while making a call and receiving a call?

OR

b) As a manager in a company you are asked to write a report of three of your subordinates for promotion. Prepare a report along with your recommendations.

13. a) Describe a memorable incident in your life.

OR

b) Write a note on skimming

14. a) What are the differences between Spoken and Written English?

OR

b) Write the symbols of Vowels. Explain with examples.

15. a) **Read the passage and draw a flow chart.**

The earth contains a large number of metals which are useful to man. One of the most important of these is iron. The iron ore which we find in the earth is not pure. It contains some impurities which we must remove in the earth is not pure. It contains some impurities which we must remove by smelting. The process of smelting consists of heating the ore in a blast furnace with coke limestone and reducing it to metal. Blasts of hot air enter the furnace from the bottom and provide the oxygen which is necessary for the reduction of the ore. The ore becomes molten, and its oxides combine with the limestone to form a liquid slag. This floats on top of the molten iron, and passes out of the furnace through a tap. The metal which remains is pig iron.

We can melt this down again in another furnace-a cupola-with more coke and limestone, and tap it out into a ladle or directly into moulds

OR

b) Write a letter to your friend Ramesh, expressing your sense of relief at his recovery from a serious and long illness

Sl.No. 1596

Sub. Code:34215101/34216101

VINAYAKA MISSIONS UNIVERSITY, SALEM

B.E. DEGREE EXAMINATION - NOV /DEC – 2018

COMMON TO BME, CSE, EEE, ECE, IT AND MECT

First Semester

ESSENTIAL OF CIVIL AND MECHANICAL ENGINEERING

(Candidates admitted under 2015&2016 Regulations - CBCS)

Time: Three hours

Maximum: 100 marks

Answer **ALL** questions

Use separate Answer books for Part I and Part II

PART – I: CIVIL ENGINEERING

(50 marks)

PART – A (10 x 2 = 20 Marks)

1. What is meant by offset?
2. How brick earth is classified?
3. What are the uses of cement?
4. State the types of concrete
5. List out different types of shallow foundations.
6. What is meant by Shallow foundation?
7. Differentiate between stretcher bond and header bond.
8. List out the mortars used in masonry work.
9. Write short notes on gravity dam.
10. Define a lintel and mention the materials which are commonly used to construct it.

PART – B (3 x 10 =30 Marks)

- 1 . a) Draw 10 conventional symbols.

OR

- b) What is chaining and explain the types of chain.

2. a) Explain different types of cement.

OR

- b) Explain with neat sketches the different types of shallow foundations.

3. a) Briefly explain the types of Floors

OR

- b) Write short notes on types of dams.

(P.T.O)

PART – II: MECHANICAL ENGINEERING**(50 marks)****PART – A (10 x 2 = 20 Marks)**

1. List out the different kinds of fossil fuels.
2. State the advantages and disadvantages of solar energy.
3. What is meant by super heater?
4. Differentiate the Nuclear fission and fusion.
5. What is meant by moderator?
6. List out the applications of four stroke and two stroke engines.
7. What is known as refrigerant?
8. Give some forging operations.
9. Why is a neutral flame extensively used in oxy-acetylene welding?
10. State the advantages and disadvantages of gas welding.

PART – B (3 x 10 =30 Marks)

11. a) Draw the layout and explain the working principle of steam power plant.

OR

- b) Compare the steam power plant with hydro power plant.

12. a) Explain the vapour compression refrigeration system with neat sketch.

OR

- b) Discuss the working principle of a window room air conditioning system with neat sketch

13. a) Briefly explain the preparation of the Green sand moulding with neat sketch.

OR

- b) Explain with neat sketch about the Arc welding.

Sl.No. 1596

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
FIRST SEMESTER
ESSENTIALS OF COMPUTER SCIENCE AND ENGINEERING
(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 What is mean by hardware?
- 2 Define Booting.
- 3 Write notes on Bullets and numbering in MS Word.
- 4 Mention the uses of MS Excel.
- 5 List out the way how algorithms may be represented.
- 6 Write an algorithm to find the area of a circle.
- 7 In what way to analyze an algorithm.
- 8 Give an example for top-down analysis.
- 9 List out any four formatting tags in HTML.
- 10 How you define href, target and name Attributes?

PART-B (5 x 16 = 80)

- 11 a. Explain the block diagram of a Computer with neat sketch.

OR

b. Describe the services provided by Internet.
- 12 a. Briefly explain table menu in MS Word.

OR

b. What is a chart and explain different steps for inserting a chart in Excel.
- 13 a. What is flowchart? Explain the symbols used in drawing the flowchart. Also write the rules and advantages of using flowcharts.

OR

b. Write an algorithm and flowchart for generating Fibonacci series.
- 14 a. Discuss the features of an algorithm.

OR

b. Explain the classification of Algorithms.
- 15 a. To create a web page to showing an ordered & unordered list of name of your five friends.

OR

b. Explain in detail about HTML image tags.

VINAYAKA MISSIONS RESEARCH FOUNDATION

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B.E. DEGREE EXAMINATION- NOV /DEC – 2018

COMMONTO AERO, AUTO, CIVIL, ECE, EEE,

EIE, CSE, IT, BME, MECH& & MECT

Second Semester

BUSINESS ENGLISH

(Candidates admitted under 2015&2016 Regulations - CBCS)

Time: Three hours

Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Correct the following sentences using subject and verb agreement.

- a). He can able to operate the computer.
- b) One of my books are missing.

2. Fill in the blank with suitable prepositions.

- a) They ceased work _____ sunset.
- b) He wrote the answer _____ ink.

3. Combine the sentences showing cause and effect relations.

- a) The machine was tested. It was installed.
- b) He was sick. He went to consult a doctor.

4. Write the meaning for the following phrasal verbs and make sentences of your own.

- a). Break up
- b). Agree with

5. Make your own sentences using the following idiomatic phrases

- a) Catch one's eye
- b) Jack of all trades

6. Write British English words for the following American English words.

- a) Fulfill
- b) Favor

7. Write American English words for the following British English Words.

- a) Litre
- b) Mould

8. Make your own sentences for the following compound words.

- a) Boat house
- b) . Animal behavior.

9. Read the answers and frame the questions.

- a) My father is sixty years old.
- b) I come from Bangkok

10. Find out the stress for the following words.

- a). Before
- b). Television

PART-B (5 x 16 = 80 Marks)

11.a) Write some interpersonal etiquette for negotiation skill.

OR

b) What are the important points to be followed by the e-mail users?

12.a) Write a note on Stress.

OR

Rewrite the following jumbled sentences in the correct order.

- b) i. If that strikes oil, then production wells can be drilled.
 ii. They carry out surveys from the ground and from the air using a variety of instruments.
 And they bore into the rocks to take samples.
 iii. When Petroleum engineers search for oil, they look for certain types of rock layers, or strata, which they know from past experience, can trap oil.
 iv. If it indicates that oil may be present, a test well is drilled.
 v. Oil is found underground trapped in the layers of rock.
 vi. When all the information is collected and analyzed, of the underground strata is obtained.
 vii. They also set off explosions in the ground and record the waves reflected from the underground rock layers.
 viii. This is called seismic surveying.

13.a) Recommendations that should be followed for safety in a factory.

OR

b) Write a set of eight recommendations following which you could avoid the attack of swine flu.

OR

14.a) Write instructions that should be followed in computer Laboratory.

OR

b) Write a letter to the Manager of Sharptronics, Chennai. Calling for quotation for the following items. Assume that you are the purchase officer.

| Items | Nos |
|--------------------|------------|
| Blue Star AC | 3 |
| Usha fans | 7 |
| L G Television 32" | 1 |
| L G Refrigerator | 1 |

15.a) Prepare a checklist to find a suitable accommodation for your family.

OR

b) Explain the following Proverbs 'No pain, no gain' and Cleanliness is next to Godliness.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
SECOND SEMESTER
CHEMISTRY FOR ENGINEERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Define oxidation and reduction.
- 2 State the reaction when a lead storage battery is recharged?
- 3 Name any two Coagulants.
- 4 What is cathodic protection?
- 5 Why are plastics indispensable in everyday life?
- 6 What is degree of polymerization?
- 7 Define component with example.
- 8 Calculate the degree of freedom for $2 \text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2 \text{H}_2\text{O}(\text{v})$
- 9 Give the frequency region of Infrared spectrum?
- 10 State Retention time.

PART-B (5 x 16 = 80)

- 11 a. Explain the determination of EMF by Poggendorff's method.

OR

- b. Discuss the electrochemical series and its applications.

- 12 a. (i)How is internal treatment of boiler water carried out?
(ii) Describe the principle and method involved in the determination of different types and amount of alkalinity of water.

OR

- b. (i) Differentiate between chemical corrosion and electrochemical corrosion.
(ii) Illustrate the reactions involved in differential aeration corrosion with reference to the iron material.

- 13 a. (a). What are ceramics and how they are classified? Write the uses of ceramics.
(b). Write a note on Special cements.

OR

- b. Write the preparation, properties and uses of the following
(i) PVC (ii) Teflon (iii) Bakelite

(P.T.O)

14 a. With suitable examples explain the terms phase, component and degree of freedom.

OR

b. Write a detail note on harmful effects of radioactive isotopes.

15 a. Describe Gas chromatography with neat diagram.

OR

b. How will you estimate metals by flame photometer?

Sl.No. 1292

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
SECOND SEMESTER
C PROGRAMMING

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What are the memory requirements of primary data type?
- 2 Mention the various types of operator
- 3 Write the syntax of switch statement.
- 4 Write the Syntax of for statement?
- 5 Find the length of following strings using strlen() function,
char s1[]="program";
char s2[]="importance";
- 6 How to declare a union variable?
- 7 Define library function
- 8 What are the advantages of using a pointer?
- 9 Write the rules for preprocessor directives.
- 10 What is the use of fseek() function?

PART-B (5 x 16 = 80)

- 11 a. Explain the Arithmetic and relational operators in C with suitable program.

OR

- b. Write a C program
- i) To find sum of 5 numbers.
 - ii) To find simple interest.

- 12 a. Explain the types of looping statements?

OR

- b. Write a C program:
- a. i. To find the factorial of a given number using while statement
 - b. ii. To find the factorial of a given number using for statement

- 13 a. Write a C program to explain the concept of structure.

OR

- b. Write a C program to explain the concept of structure within structure.

- 14 a. Discuss the pointer expressions used in the C program.

OR

- b. Write a C program to implement function returning pointers.
- 15 a. Write a C program to altering the allocated memory.

OR

- b. Write about the following function,
 - i. fputs() ii. fgets() iii. fread() iv. fwrite()

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)

B.E. DEGREE EXAMINATION- NOV /DEC - 2018
BIOMEDICAL ENGINEERING

Third Semester

STOCHASTIC PROCESS AND NUMERICAL METHODS
(Candidates admitted under 2015&2016 Regulations - CBCS)

Time: Three hours

Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What is the difference between Interpolation and Extrapolation?
2. When Bessel's formula is to be used?
3. Write the Runge-Kutta algorithm of second order for solving $\frac{dy}{dx} = f(x, y), y(x_0) = y_0$.
4. How many prior values are required to predict the next value in Milne's method?
5. Suppose that the random variable X assumes three values 0, 1 and 2 with probabilities $1/3, 1/6$ and $1/2$ respectively. Obtain the distribution function of X .
6. If X is a random variable prove that $E[aX + b] = aE[X] + b$.
7. Define first order stationary process
8. Define Binomial process.
9. Check whether $2\sin \pi \tau$ is a valid autocorrelation.
10. Mention any two properties of cross power spectrum.

PART-B (5 x 16 = 80 Marks)

- 11.a) Given $\log_{10} 654 = 2.8156, \log_{10} 658 = 2.8182, \log_{10} 659 = 2.8189,$ and $\log_{10} 661 = 2.8202,$ find the value of $\log_{10} 656$ using Newton's Divided Difference Formula.

OR

- b) Using Stirling's formula obtain the value of $f(12)$ given

| | | | | |
|------|-------|-------|-------|-------|
| x | 5 | 10 | 15 | 20 |
| f(x) | 54.14 | 60.54 | 67.72 | 75.88 |

- 12.a) Using Taylor's method Solve

$$\frac{dy}{dx} = 1 + xy \text{ given } y(0) = 2. \text{ Find (i) } y(0.1), \text{ (ii) } y(0.2) \text{ and (iii) } y(0.3).$$

OR

- b) Given $\frac{dy}{dx} + y - x^2 = 0, y(0.2) = 0.8213,$ find correct to four decimal places $y(0.3)$ using modified Euler's method.

13.a) A random variable X has the following probability distribution

| | | | | | | |
|-------------|-----|----|-----|----|-----|----|
| Values of X | -2 | -1 | 0 | 1 | 2 | 3 |
| P(x) | 0.1 | k | 0.2 | 2k | 0.3 | 3k |

- (i) Find 'k'
(ii) evaluate $P(X < 2)$ and $P(-2 < X < 2)$
(iii) find the CDF of X (iv) evaluate the mean of X .

OR

b) Show that the random process $X(t) = A \cos(\omega t + \theta)$ is wide sense stationary if A and ω are constants and θ is uniformly distributed in the interval $(0, 2\pi)$.

14.a. Verify whether the sine wave random process $X(t) = Y \sin \omega t$, Where Y is uniformly distributed in the interval $(-1, 1)$ is WSS or not.

OR

b)) A man either uses a car or catches a train to go office each day. He never goes 2 days in a row by train but he drives one day, then the next day he is just as likely to drive again as he is to travel by train .Now suppose that on the first day of the week ,the man tossed a fair dice and drove to work if and only if a 6 appeared . Find the probability that he went by a train on the third day and also the probability he went by a car to work in a long run?

15.a) For the Random process $X(t) = A \sin(\omega t + \varphi)$, where A and ω are constants, φ is a random variable uniformly distributed in $(0, 2\pi)$, find the autocorrelation function of the process.

OR

b) The cross power spectrum of real random processes $\{X(t)\}$ and $\{Y(t)\}$ is given

$$\text{by } S_{XY}(\omega) = \begin{cases} a + jb\omega, & |\omega| < 1 \\ 0, & \text{elsewhere} \end{cases}$$

Find the Cross-correlation function.

Sl.No. 1525

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO BME,CSE,EEE AND ECE
THIRD SEMESTER
DIGITAL ELECTRONICS

(Candidates admitted under 2015 &2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What is meant by natural BCD code?
- 2 Why is a hexadecimal number system called as an alphanumeric number system?
- 3 State the associative property of Boolean algebra.
- 4 Define integrated circuit.
- 5 Give the truth table of a full adder.
- 6 Specify the application of combinational circuit.
- 7 Define synchronous counter.
- 8 What is BCD counter?
- 9 Define control logic.
- 10 Mention the type of operations most often encountered in digital system.

PART-B (5 x 16 = 80)

- 11 a. Convert the following numbers with the indicated bases:
 i) $(10110001101.1111001)_2 = (?)_8$, $(173.124)_8 = (?)_2$ and $(CAD)_{16} = (?)_8$
 ii) $(10110001101011.1111001)_2 = (?)_{16}$ and $(306.D)_{16} = (?)_2$

OR

- b. a) With a suitable example explain the signed binary numbers in detail.
 b) i) Multiply the binary numbers 1001 by 1101 ii) Subtract the binary number 1011 and 0110.
- 12 a. i) Implement the following Boolean function using NOR gates.
 $F = (AB^2 + A^2B)(C+D)$
 ii) Simplify the following Boolean function in SOP and POS and implement the output expression by using logic gates:
 $F(A,B,C,D) = \sum (0,1,2,5,8,9,10)$

OR

- b. a) Simplify the Boolean function $F(W,X,Y,Z) = \sum (5,6,9,10)$ Which has the don't-care conditions $D(W,X,Y,Z) = \sum (0,2,11)$
 b) Implement the exclusive-OR function by using digital logic gates.

- 13 a. Design a half and full subtractor circuit with inputs x and y and outputs D and B. Implement the output expression by using digital logic gates.

OR

P.T.O

2

- b. Design a 2-to-4-line and 3-to-8 line Decoder circuits.

- 14 a. Using JK flip flops, design a synchronous counter which counts in the sequence,000,001,010,011,100,101,110,111,000

OR

- b. Design and explain the working of a 4-bit ripple counter with a neat diagram.

- 15 a. Illustrate ASM with suitable example.

OR

- b. Explain the HDL description of binary multiplier.

Sl.No. 1467

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
THIRD SEEMSTER
BIOMEDICAL CIRCUITS & NETWORKS
(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

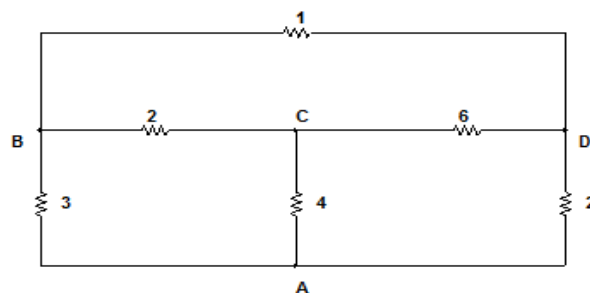
Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 Define Tree and Cotree.
- 2 Compare active and passive elements.
- 3 Where and why thevenin's theorem applied?
- 4 Write the formula for finding the Thevenin's resistance.
- 5 What is resonance frequency and Bandwidth of a series RLC circuit in which $R=5\Omega$, $L=40\text{mH}$, $C=1\mu\text{F}$?
- 6 Define self inductance. What is its unit?
- 7 In RLC transient circuit what is the condition for critical damping?
- 8 Find the time constant of RL circuit having $R=10\Omega$ and $L=0.1\text{mH}$.
- 9 Give the conditions for passive reciprocal network.
- 10 Write the properties of RL driving point functions.

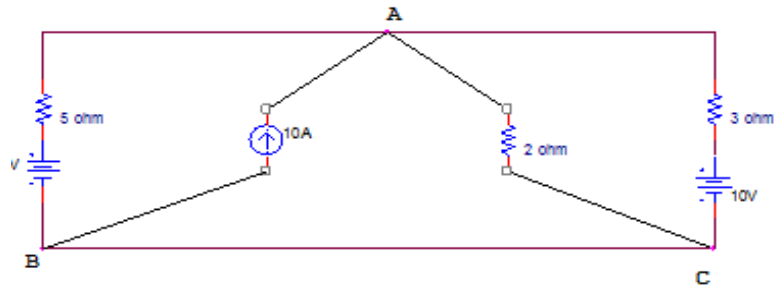
PART-B (5 x 16 = 80)

- 11 a. For the network given, draw the graph and a tree. Show the link currents. Write the tie-set schedule for the tree, the equations for branch currents in terms of link currents. Also write independent equations.



OR

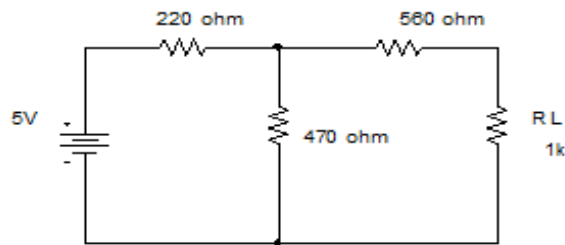
- b. i) By using source transformation, find the power delivered by the 50V voltage source in the circuit shown in figure.



- ii) Write short notes on Incidence Matrix.

12 a.

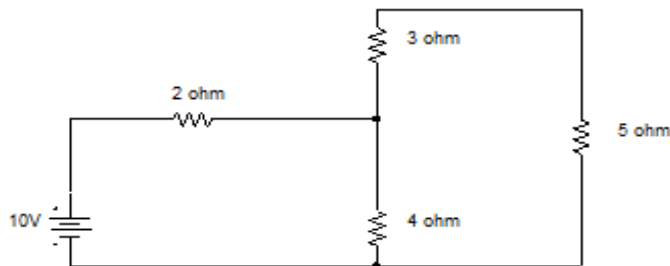
- i. Find the current through the load resistor R_L in the given circuit. Using Thevenin's theorem.



- ii. Write the steps involved in the Norton's theorem and draw an equivalent circuit.

OR

- b. i) Verify the reciprocity theorem for the circuit shown in figure.



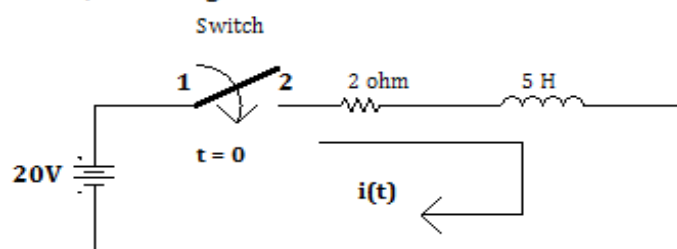
- ii) Write the steps involved in the superposition theorems.

13 a.

- (i) Derive the Q-factor of parallel resonance circuit.
 (ii) One RLC circuit has $R=30\Omega$, $L=40\text{mH}$ and $C=50\mu\text{F}$. Find the resonant frequency. Under resonant conditions, calculate the current and voltage drops across the R, L, and C if applied voltage is 120V.

OR

- b. i) A coil of resistance 40Ω and inductance 0.75H forms part of a series circuit for which the resonant frequency is 50Hz . If the supply is 250V , 50Hz . Find the line current, power factor and voltage across the coil.
- ii) A series RLC circuit with $Q=250$ is resonant at 1.5MHz . Find the frequencies at half power points and also bandwidth.
- 14 a. In the circuit shown in figure below find the expression for transient current after the switch is closed at $t=0$, assuming zero initials conditions.



OR

- b. Draw the DC response of R-L circuit and derive the power equation of resistor and inductor.
- 15 a. Synthesis the following network function in Foster form - I with Resistors & Capacitors.
Given

$$Z(s) = \frac{3(s+2)(s+4)}{s(s+3)}$$

OR

- b. Derive the Y- parameter in terms of Z - parameter of two port networks.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO BME AND ECE
FOURTH SEMESTER
MICROCONTROLLERS AND APPLICATIONS
(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 What are the segments registers of 8086?
- 2 List the advantages of using segment registers in 8086.
- 3 Mention the basic modes of operation of 8255.
- 4 What are the modes used in analog to digital convertor using 8086?
- 5 Mention the register IE format of 8051.
- 6 What is the function of IP register in 8051?
- 7 What is the type of instruction set in 8051 microcontroller?
- 8 Name the unconditional jump instruction of 8051 microcontroller.
- 9 Define Interfacing.
- 10 Give some features of stepper motor.

PART-B (5 x 16 = 80)

- 11 a. Describe the logical and branching instruction set of 8086 with examples.
OR
b. Discuss in detail about different Addressing Modes available in 8086.
- 12 a. With a neat diagram explain the function of 8253.
OR
b. With neat diagram explain the D/A Convertor using 8086.
- 13 a. Explain in detail about the special function registers available in 8051
OR
b. With a neat sketch, explain in detail about SCON
- 14 a. Describe the various addressing modes in 8051.
OR
b. Write an assembly language program for two 8 bit addition and multiplication in 8051.
- 15 a. Discuss on ADC interfacing with a neat diagram.
OR
b. Write short notes on: i) ADC ii) DAC

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIO MEDICAL ENGINEERING
FOURTH SEMESTER
COMMUNICATION CIRCUITS & SYSTEMS
(Candidates admitted under 2015 &2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 Define modulation.
- 2 A 400W carrier is modulated to a depth of 75%. Calculate the total power in the modulated wave.
- 3 What are the two methods of producing an FM wave?
- 4 Define the deviation ratio D for non-sinusoidal modulation.
- 5 Mention the use of adaptive quantizer in adaptive digital waveform coding schemes.
- 6 What is the advantage of delta modulation over PCM?
- 7 What are eye pattern?
- 8 List the requirements of Passband transmission.
- 9 What are the applications of spread spectrum communication?
- 10 What is meant by pseudo random noise?

PART-B (5 x 16 = 80)

- 11 a. Write short notes on: i) Tuned Radio Frequency Receiver ii) Super heterodyne Receiver.

OR

- b. Explain in detail about vestigial side band system with neat diagram.

- 12 a. Draw the ratio detector circuit and explain briefly.

OR

- b. Draw the block diagram of stereophonic FM transmitter and briefly explain.

- 13 a. Discuss about the generation and demodulation of PCM and detecting it.

OR

- b. Explain in detail about base band binary data transmission system with suitable diagram

- 14 a. Draw the block diagram of ASK modulator and demodulator explain briefly.

OR

- b. Explain in detail about performance comparison of digital modulation schemes.

- 15 a. Briefly describe pre assigned FDMA and explain briefly.

OR

- b. Explain in detail about the performance of direct sequence spread spectrum in the presence of interference.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIO MEDICAL ENGINEERING
FOURTH SEMESTER
BIOMEDICAL CONTROL SYSTEMS

(Candidates admitted under 2015&2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

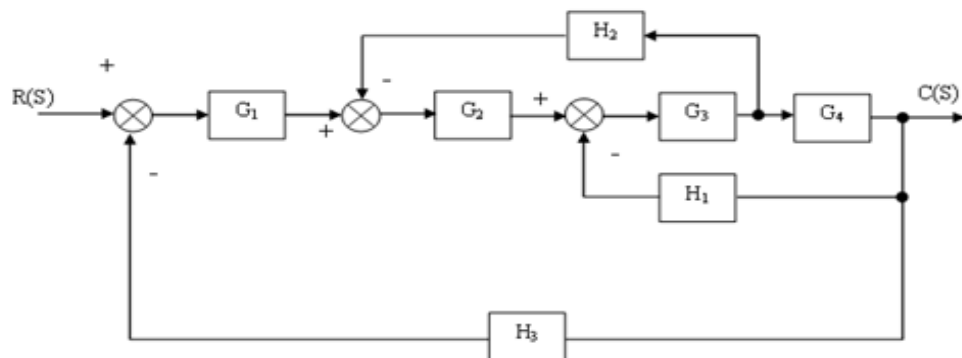
Part-A (10 x 2 =20 Marks)

- 1 Write the Mason's gain formula.
- 2 Give the important features of feedback.
- 3 Define damping and damping ratio.
- 4 Define rise time and settling time.
- 5 What do you mean by root locus technique?
- 6 When a system is said to be limitedly stable?
- 7 Define resonant peak.
- 8 What is polar plot?
- 9 State knee jerk reflex.
- 10 Define pupil.

PART-B (5 x 16 = 80)

11 a.

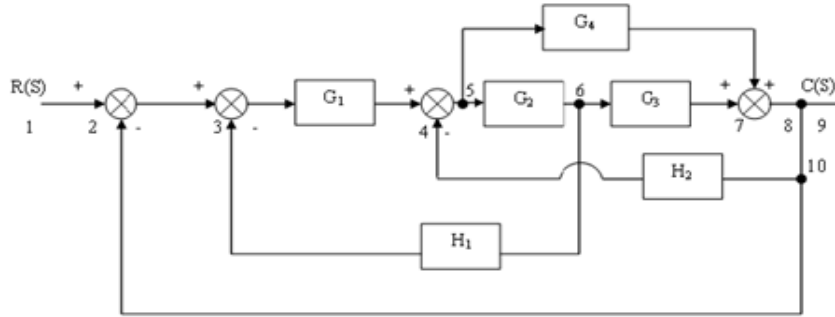
Using block diagram reduction technique find closed loop transfer of the system.



OR

P.T.O

- b. Convert the block diagram to signal flow graph and determine the transfer function using mason's gain formula.



- 12 a. i) Consider the unity feedback system whose open loop transfer function is $G(s)=10/(s+2)(s+5)$. Find damping ratio ' ζ ' and natural frequency ' ω_n '.
 ii) Write the expression for time domain specifications of peak overshoot and settling time of second order system with suitable derivation.

OR

- b. i) Derive the expression for steady state error.
 ii) Elaborate about PID controller.
 iii) Write short notes on effect of adding poles and zeros to transfer function
- 13 a. i) Determine the range of K for stability of unity feedback system whose open loop transfer function is $G(S)=K/s(s+1)(s+2)$.
 ii) Narrate about construction of Routh array.

OR

- b. i) Using Routh criterion, determine the stability of the system represented by the characteristics equation, $s^4+8s^3+18s^2+16s+5 = 0$. Comment on the location of the roots of characteristics equation.
 ii) Investigate whether the following systems represented by characteristics equation are stable or not.
 a) $s^5+4s^4+s^2+s+2=0$
 b) $5s^4-2s^3+3s^2+2s+16=0$
 c) $12s^3-s+10=0$
 d) $s^4+2s^3+5s^2+s=0$
- 14 a. Sketch Bode plot for the following transfer function and determine the system gain K for the gain cross over frequency to be 5 rad/sec. $G(s)=Ks^2/(1+0.2s)(1+0.02s)$.

OR

- b. A unit step response test conducted on a second order system yielded peak overshoot $M_p=0.12$ and peak time $t_p=0.2$ sec. Obtain the corresponding frequency response indices resonant peak (M_r), resonant frequency (ω_r) and bandwidth (ω_b) for the system.
- 15 a. Give an overview of the oculo-motor system, supporting its control mechanism using a biological control system.

OR

- b. Explain about the skeletal muscle servomechanism with a neat sketch.

Sl.No. 1838

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E-DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
FOURTH SEMESTER
MEDICAL INSTRUMENTATION - I

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Distinguish polarized and non-polarized electrodes.
- 2 What are bipolar and unipolar electrodes?
- 3 What are the basic requirements of an Instrumentation Amplifier?
- 4 Draw and label the normal ECG waveform.
- 5 Mention the different methods used for measurements of blood pressure.
- 6 What are the two common photo electric methods used for pulse rate measurement?
- 7 What are the two types of Indicator Dilution Method?
- 8 State the principle used in laser based blood cell counting.
- 9 What are the electrodes used for measurement of blood PH value?
- 10 Draw the block diagram for transmission of analog signals over telephone lines.

PART-B (5 x 16 = 80)

- 11 a. Explain the mechanism of electrode – tissue interface for surface electrodes.
OR
b. Describe the types of surface electrodes used for bio potential measurements.
- 12 a. Discuss about different types of placement of electrodes in EEG measurement system.
OR
b. Draw the typical waveform of ECG and explain its segments and intervals.
- 13 a. What are the methods used for pulse measurement? Explain them in detail.
OR
b. Illustrate indicator dilution method of cardiac output measurement.
- 14 a. Discuss the various methods of blood cell counting briefly.
OR
b. Discuss about NMR blood flow meter.
- 15 a. Explain the multi-channel patient monitoring telephone telemetry system for transmitter and receiver.
OR
b. Describe the theory of blood pH measurement briefly

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E-DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
FOURTH SEMESTER
BIOSENSORS AND TRANSDUCERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Name the parameters that dictate the transducer capability.
- 2 Define gauge factor.
- 3 What is a Thermistor?
- 4 Write about the optical transducers.
- 5 What is Electrode Potential?
- 6 Mention the types of micro electrodes.
- 7 Write short note on biological elements
- 8 Write a short note on ISFET.
- 9 Write a short note on Urease Biosensor.
- 10 Give the short note on potentiometric biosensor.

PART-B (5 x 16 = 80)

- 11 a. Explain about the types of Strain Gauges in detail.
OR
b. With neat diagram, explain the working Principle of LVDT.
- 12 a. With a neat diagram explain flow transducer and its application.
OR
b. Explain about photomultiplier tube and vacuum phototube.
- 13 a. Elucidate about limb electrodes.
OR
b. Write a detail note on floating electrode.
- 14 a. Explain about Antibodies in detail.
OR
b. Explain about receptors.
- 15 a. Give detailed study on fermentation process control.
OR
b. Explain about bananatrode.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIO MEDICAL ENGINEERING
FOURTH SEMESTER
BIOMATERIALS AND ARTIFICIAL ORGANS
(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 Classify the Biomaterials.
- 2 Draw the structure of teeth.
- 3 What is the effect of adding molybdenum and nickel in stainless steel?
- 4 Give two example for Elastomers
- 5 What is artificial heart valve?
- 6 What are the internal fracture fixation devices?
- 7 What are the cells involved in inflammation?
- 8 Name the pathways of coagulation.
- 9 List out the ISO recommended vitro tests for cytotoxicity.
- 10 Mention the delivery routes for insulin.

PART-B (5 x 16 = 80)

- 11 a. Explain the structure and properties of Collagen.

OR

b. Giver an account on Surface coatings methods.
- 12 a. Giver an account on dendrimers.

OR

b. Explain the structure, properties and manufacturing of hydroxyapatite.
- 13 a. Give detail account on internal fracture fixation devices.

OR

b. Explain in detail about the stent grafts.
- 14 a. Discuss in detail about Blood–Materials Interactions.

OR

b. Explain the oxidative degradation of polymer in detail.
- 15 a. Write an essay on Artificial Heart.

OR

b. Explain the basic components and applications of neural prostheses.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO BME,CSE,ECE AND IT
FIFTH SEMESTER
ENVIRONMENTAL SCIENCE AND ENGINEERING
(Candidates admitted under 2015 &2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 What is called a Mineral? Give two examples.
- 2 State environmental effects of extracting and using mineral resources.
- 3 Define producers, consumers and decomposers in an ecosystem.
- 4 Differentiate between species and genera.
- 5 Name any four air pollutants and their sources and effects.
- 6 Define the term incineration.
- 7 Enlist the objectives of air pollution act.
- 8 Write an account on issues involved in enforcements of environmental legislation.
- 9 Explain the term population dynamics.
- 10 What is meant by telemedicine?

PART-B (5 x 16 = 80)

- 11 a. Write about the problems and benefits that are faced in constructing a dam.

OR

b. Write about nuclear fission and nuclear fusion.
- 12 a. Explain various types of Ecological pyramids.

OR

b. Discuss the value of Biodiversity.
- 13 a. Write in detail about water pollution that is caused by the heavy metals present in it.

OR

b. Explain the case studies due to i) Air pollution ii) Water pollution iii) Marine pollution.
- 14 a. Discuss water shed management.

OR

b. Write in detail about ozone layer depletion.
- 15 a. Write a detailed account on the AIDS disease, its transmission tests and prevention measures.

OR

b. Explain how the remote sensing satellites help in the study of environment.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
FIFTH SEMESTER
MEDICAL INSTRUMENTATION - II

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What is Demand Pacemaker?
- 2 What is meant by Monophasic Waveform?
- 3 Explain residual volume.
- 4 Define vital capacity.
- 5 What are the limitations of Ultrasound?
- 6 Define linear B-scan.
- 7 Define the term diathermy.
- 8 Write the advantages of Diathermy.
- 9 What are the types of Thermograph?
- 10 What is let go current?

PART-B (5 x 16 = 80)

- 11 a. Narrate on Demand Pacemaker.

OR

 - b. Explain about Fibrillation problems and Mention how to treat Fibrillation problems.
- 12 a. Draw and Explain briefly about the Pneumotachometer diagram.

OR

 - b. Explain about Pulmonary Function analysers.
- 13 a. Explain the function of echo encephalography.

OR

 - b. Explain about A Mode in ultrasonic scan.
- 14 a. Explain about surgical diathermy analyzers.

OR

 - b. Narrate on Ultrasonic therapy unit.
- 15 a. Explain in detail about micro shock.

OR

 - b. Explain about electrical safety analyser.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
FIFTH SEMESTER
BIOMEDICAL SIGNAL PROCESSING

(Candidates admitted under 2015& 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Define saltatory conduction.
- 2 Write about oto-acoustic emission signals.
- 3 What is random noise?
- 4 List out the guiding principles to determine temporal MA filter for any application.
- 5 What is QRS wave?
- 6 Define Zero-crossing rate.
- 7 What is pole zero modeling?
- 8 How many grades are there in Chondromalacia Patella?
- 9 Write the disadvantages of simple clusture-seeking algorithm.
- 10 List out the demerits of nearest-neighbor rule.

PART-B (5 x 16 = 80)

- 11 a. Explain in detail about electromyogram.

OR

 b. Discuss the technique of phonocardiogram.
- 12 a. Give an account on derivative based operators to remove low-frequency artifacts.

OR

 b. Narrate in detail about the recursive least-squares adaptive filter.
- 13 a. Describe about Pan-Tompkins algorithm for QRS detection.

OR

 b. Narrate in detail about the envelope extraction.
- 14 a. Discuss about analysis of heart-rate variability.

OR

 b. Narrate about fixed segmentation of a system.
- 15 a. Explain in detail about leave-one-out method.

OR

 b. Explain pattern classification technique for detection of knee joint cartilage pathology.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
FIFTH SEMESTER
COMPUTERS IN MEDICINE

(Candidates admitted under 2015& 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Define segment registers in 8086.
- 2 What is FDC?
- 3 State the use of the Coulter Counter.
- 4 Define SECG.
- 5 What are time activity curves?
- 6 Write four generations of CT scanner?
- 7 What are neurocomputers?
- 8 Define supervised learning.
- 9 What is knowledge engineering?
- 10 What are cognitive models?

PART-B (5 x 16 = 80)

- 11 a. Write the instructions set of 8051 with examples.
OR
b. With a block diagram explain the CRT controllers.
- 12 a. Brief on CASA, RIA and ILIS.
OR
b. Brief on computerized EEG.
- 13 a. Explain the Imaging principles in CT.
OR
b. Explain with a block diagram an MRI system.
- 14 a. Explain the architecture and working of McCulloch-Pitts Neuron with an example.
OR
b. Brief on the architecture and working of counter propagation networks.
- 15 a. Explain database comparisons and case based reasoning.
OR
b. Brief on Knowledge Engineering Process and CMD via the internet.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
FIFTH SEMESTER
ELECTIVE - BIOMEDICAL INFORMATICS
(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Mention the benefits of HMIS.
- 2 Mention some advantages of Hospital information system.
- 3 What is a Decision Tree?
- 4 Mention the advantages of Expert System.
- 5 What is Framed Stereotactic Surgery?
- 6 Mention some advantages of Hospital Information System.
- 7 Define Voxel.
- 8 What is Virtual Otoscopy?
- 9 Define Tele-Mentoring.
- 10 Define Tele-Dermatology.

PART-B (5 x 16 = 80)

- 11 a. Discuss in detail about the interconnection between HMIS and Internet.
OR
b. Write note on:
PACS (6).
DICOM (6).
- 12 a. Describe the methods of knowledge representation in expert systems.
OR
b. Write notes on the ideal features of a CPR and its functional requirements.
- 13 a. Write detailed notes on Indoor Ward Module & Patient Care Module.
OR
b. Write detailed notes on Diet Planning Module and pharmacy module.
- 14 a. Describe in detail about the application of Three Dimensional Imaging.
OR
b. Narrate in detail about Virtual Pancreatocopy.
- 15 a. Elaborate the need for Telemedicine and its advantages.
OR

b. Discuss the materials used in Tele-surgery.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
FIFTH SEMESTER
ELECTIVE -THERAPEUTIC & SURGICAL EQUIPMENTS
(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 What is Demand Pacemaker?
- 2 What are the types of Fibrillation?
- 3 Define TENS.
- 4 How the microwaves are produced?
- 5 What is GFR in kidney?
- 6 What is extra corporeal shock wave lithotripsy?
- 7 Why anaesthetic gases need to be humidified?
- 8 What is photo chemotherapy?
- 9 What is Humidifier, nebulizer and aspirators?
- 10 What is PEEP?

PART-B (5 x 16 = 80)

- 11 a. Differentiate external and implantable pacemaker in detail.
OR
b. Explain about implantable DC Defibrillator.
- 12 a. Explain about surgical diathermy analysers.
OR
b. Discuss about short wave diathermy.
- 13 a. Illustrate the stone disease problem and the need of lithotripters.
OR
b. Write short notes on dialysers and parallel flow dialysers.
- 14 a. Describe patient breathing system with suitable diagrams.
OR
b. Explain the various classification of vaporizer with suitable schematic diagram?
- 15 a. Draw and explain the microprocessor controlled ventilator.
OR
b. Classify ventilator based on
 - (a) Methods of initiating the inspiratory flow
 - (b) Pressure pattern
 - (c) Cycling from inspiration to expiration.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIO MEDICAL ENGINEERING
SIXTH SEMESTER
MEDICAL IMAGE PROCESSING
(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 Define modeling.
- 2 What is virtual CT scanning?
- 3 What is polyploid lesion?
- 4 Write the PMBC algorithm
- 5 State the important points to be considered to evaluate the efficacy of lesion segmentation methods.
- 6 How the RGI value is calculated?
- 7 Define semantic oct-tree.
- 8 In zero trees of wavelet co-efficient, when zero parent co-efficient is said to be zero tree root and when it is said to be isolated zero.
- 9 Why interpolation is required in registration algorithm?
- 10 Define entropy correlation coefficient.

PART-B (5 x 16 = 80)

- 11 a. Demonstrate the three different stages of the biomechanical model construction.

OR

b. Discuss the global transformation computation of mesh registration.
- 12 a. Describe the histology of the human colonic surface in detail.

OR

b. Illustrate multiscale decomposition by fast wavelet transform (FWT) in diagnosing colon cancer.
- 13 a. Write a review on blind deblurring methods used in spiral computed tomography images

OR

b. Explain the clinical sonographic features used by radiologist for distinguishing between malignant, benign and intermediate lesions.
- 14 a. Explain about the three dimensional integer DWT via Lifting.

OR

b. Explain 3D embedded zero tree wavelet based coding.
- 15 a. Write a short note on:
 - i) Shape model generalization ability
 - ii) Shape model specificity

OR

b. Briefly explain any one methods of interpolation induced artifacts reduction.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
SIXTH SEMESTER
RADIOLOGICAL EQUIPMENTS

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Compare radiography and angiography.
- 2 What is the use of grids in an x-ray machine?
- 3 What filter used in radiography?
- 4 Mention the use of grids in X-ray machine.
- 5 The angle of rotation of net magnetic moment for applied RF pulse, depends on what parameters?
- 6 How can motion artifacts be reduced or eliminated?
- 7 List out the properties of gamma rays.
- 8 What is meant by sievert?
- 9 Define ICRP.
- 10 List the sources of man-made background radiation, from largest to smallest.

PART-B (5 x 16 = 80)

- 11 a. Describe the functions of collimator and grid used in x-ray imaging.

OR

 b. Briefly explain i)) Digital radiography
 ii) The physical parameters used to characterize x-ray detectors.
- 12 a. Describe the basic principles of computer tomography in detail.

OR

 b. Write short notes on viewing system and storage unit in CT scan system.
- 13 a. Discuss FID and relaxation times T1, T2 and T2* in detail.

OR

 b. Explain in detail about the types of magnets used in NMR.
- 14 a. Draw and explain the block diagram of pulse height analyser..

OR

 b. Draw and explain the function of gamma camera.
- 15 a. Discuss briefly the effect of man made and natural background radiation.

OR

 b. Describe the Dose effect model for risk estimation of radiation to which the individual is exposed.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
SIXTH SEMESTER
BIO - TELEMETRY

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Mention the types of non-electrical telemetry systems.
- 2 Mention the elements available in a biotelemetry system.
- 3 Define amplitude modulation
- 4 What is intermediate frequency?
- 5 Define frequency modulation.
- 6 Define phase deviation.
- 7 How granular noise does occur?
- 8 What do you understand from adaptive coding?
- 9 Draw the block diagram of single channel telemetry.
- 10 Write the advantages of transmission of analog physiological signal over telephone.

PART-B (5 x 16 = 80)

- 11 a. Explain in detail about the classification of mechanical telemetry system.
OR
b. Elucidate about local transmitters and converters.
- 12 a. Write short notes on:
i) Tuned radio frequency receiver ii) Super heterodyne receiver
OR
b. Draw the block diagram of SSB receiver and explain.
- 13 a. Draw the ratio detector circuit and explain briefly.
OR
b. Draw the block diagram of indirect method of FM generation and briefly explain.
- 14 a. What are eye patterns? Discuss the performance of data transmission system using eye patterns.
OR
b. Explain about the FSK modulator and demodulator with suitable diagram.
- 15 a. Explain about multi channel telemetry system.
OR
b. Explain about transmission of transmission of analog physiological signal over telephone.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIO MEDICAL ENGINEERING
SIXTH SEMESTER
NANOTECHNOLOGY IN MEDICINE
(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 Define nanotechnology
- 2 State the structures and bonds of nanomaterials.
- 3 List out the particle size determination methods.
- 4 List out the semiconducting nanoparticles.
- 5 Mention some properties of MEMS materials
- 6 List out the difference between MEMS and NEMS.
- 7 How the nanomaterial's regulated?
- 8 What is a neuro-electronic interface?
- 9 State the advantages of nanobiotechnology.
- 10 What is the need for nano sensors?

PART-B (5 x 16 = 80)

- 11 a. Describe in detail about lithography and its types.
OR
b. Explain the structure of the C60 molecule and its stability.
- 12 a. With a suitable diagram discuss about TEM method of particle analysis.
OR
b. What is dip-pen lithography? Explain how protein arrays can be created by this technique.
- 13 a. Explain PVD method for MEMS fabrication.
OR
b. Explain in detail about any one type of NEMS with suitable diagram.
- 14 a. Give a detailed insight on cancer surgery.
OR
b. Explain in detail on a neuro interface application.
- 15 a. Give a detailed insight on genes and gene delivery system.
OR
b. Describe about physical and chemical synthesis methods and explain any one method in detail with required images.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E -DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
SIXTH SEMESTER
ASSIST DEVICES

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Define cardiac assist devices.
- 2 List out the problems that interfere with the successful performance of valves.
- 3 Define dialyzer.
- 4 What is residual blood volume?
- 5 Define transfemoral prosthesis.
- 6 What are the suspension mechanisms used in lower extremity prostheses?
- 7 List out the transducers employed in audiometer.
- 8 Draw the block diagram of DSP based hearing aid.
- 9 What are the types of high frequency ventilation strategies?
- 10 Classify the ventilator based on the source of power.

PART-B (5 x 16 = 80)

- 11 a. Describe the open and closed chest left ventricular bypass in detail.

OR

- b. Write short note on the following:
i) Triggering and timing in IABP. ii) Biological Heart Valves.

- 12 a. Write a short essay on dialysate.

OR

- b. Briefly explain about blood leak detector in dialysis machine.

- 13 a. Explain the improved control of body powered prosthesis.

OR

- b. Describe in detail about sensory assist devices.

- 14 a. Describe the speech audio meter and speech-threshold testing.

OR

- b. Describe in detail about calibration and masking in audiometry.

- 15 a. Describe the ventilator terms in detail.

OR

- b. Explain the various in-line nebulisation in detail.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E-DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
SEVENTH SEMETER
ELECTIVE - EMBEDDED & REAL TIME SYSTEMS
(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 Mention the features of ARM Processor
- 2 Define Iso Synchronous communication
- 3 What are Configuration Files?
- 4 Define FSM Model
- 5 What are the Goals of OS Services?
- 6 Define RTLinux
- 7 Define Performability.
- 8 Define Rate Monotonic deferred server.
- 9 Differentiate Real Time and General Purpose Databases.
- 10 What is Wormhole Routing?

PART-B (5 x 16 = 80)

- 11 a. Enumerate the hardware and software units involved in automatic chocolate vending machine.

OR

- b. Discuss the 8051 architecture with neat diagram.

- 12 a. Discuss the Various Program Models with examples.

OR

- b. Explain the functions of Message Queue, Mailbox and Pipes with suitable Examples.

- 13 a. Elucidate the memory management strategy and device management functions in RTOS.

OR

- b. Enumerate the windows CE RTOS basic features with neat diagram.

- 14 a. Discuss the various Classical Uniprocessor Scheduling Algorithms.

OR

- b. Elucidate the Uniprocessor Scheduling of IRIS Tasks.

- 15 a. Explain the Databases for Hard Real Time Systems with diagram.

OR

- b. Describe the Polled Bus Protocol with necessary diagram.

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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIO MEDICAL ENGINEERING
SEVENTH SEMESTER
BIOMETRIC SYSTEMS

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 How biometrics is mainly classified?
- 2 Define Matching.
- 3 What is Fingerprint identification?
- 4 Define New Intensity
- 5 State the need for localization in iris recognition.
- 6 List the advantages of Advantages of iris recognition.
- 7 How does face recognition work?
- 8 Mention the commonly used Face Representation Techniques.
- 9 What are the major factors influence the choice of the speaker model?
- 10 What is the equal error rate parameter?

PART-B (5 x 16 = 80)

- 11 a. Describe the system model of a generic biometric system.
OR
b. Discuss on the privacy issues of a biometric system.
- 12 a. Write in detailed notes on Commercial Applications of fingerprint biometrics.
OR
b. Explain with examples the Civil Applications of fingerprint biometrics.
- 13 a. Explain briefly about on IRIS signature representation.
OR
b. Describe the three systems involved in the matching process of IRIS recognition systems.
- 14 a. Elucidate the face recognition steps with emphasis on the Classification techniques.

OR

- b. Explain briefly about learning the Face Space.
- 15 a. Describe the NIST Speaker Recognition Evaluation tasks.
OR
b. Discuss about the multimodal evaluation of the NIST speaker recognition evaluation program.

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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
SEVENTH SEMESTER
HOSPITAL ENGINEERING

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Define hospital planning.
- 2 What are the features of an ideal OPD system?
- 3 What is an operation theatre?
- 4 Write five objectives of CSSD.
- 5 Define Operative functions.
- 6 What is called as demotion?
- 7 How computers are useful in medical records department inhospital?List out the advantages of medical record maintenance.
- 8 What is the cause of hospital infection?
- 9 What is hospital communication?
- 10 What is meant by standard precautions?

PART-B (5 x 16 = 80)

- 11 a. Elaborate the five zone classificationofhospitals.
OR
b. Narrate the outpatient services in Hospital.
- 12 a. Write a brief description on operation theatre suit in hospitals.
OR
b. Discuss the important of clinical services in hospital.
- 13 a. Elaborate the objectives of recruitment.
OR
b. Explain the types of transfer.
- 14 a. Write the importance of central sterilization.
OR
b. Explain the purpose of CSSD and sterilization cycle.
- 15 a. Discuss the various safety rules followed by the hospitals.
OR
b. Give a brief note on importance of infection control.

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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
SEVENTH SEMESTER
MEDICAL WASTE MANAGEMENT

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What should be done with used BMW containers?
- 2 Who can accept BMW from households?
- 3 Regarding sharps disposal, if the container is not full, what is the maximum time that it can be kept on a shelf, and should it always be kept closed?
- 4 How does medical waste affect the public?
- 5 Are there health risks for those who live in close proximity of a facility that autoclaves and shreds medical waste?
- 6 Can syringes, with needle attached, which did not contain blood or body fluid, be placed in the regular trash?
- 7 What kind of regular and multidrug-resistant pathogens do contaminated healthcare linens?
- 8 What type of things are classified under medical waste?
- 9 What kind of air pollution controls will be used in gas plants?
- 10 What PPE should be worn by healthcare workers in general healthcare settings?

PART-B (5 x 16 = 80)

- 11 a. Explain in details various methods of handling medical wastes.

OR

b. Explain in detail about collection and disposal of biomedical waste.
- 12 a. Explain in details about various types of Liquid Biomedical Waste.

OR

b. Discuss about the composition of Biomedical waste.
- 13 a. How to Store and Dispose of Radioactive Waste discuss in detail?

OR

b. Elaborate the Production of blood components and blood derivatives.
- 14 a. Discuss briefly about Disinfections unit container for Autoclaving.

OR

b. Explain how the various types of medical wastes are transported.
- 15 a. What are the impact of infectious diseases & Health hazards in waste management?

OR

b. Elaborate New Technologies in Infection Prevention.

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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
SEVENTH SEMESTER
ELECTIVE - THERAPEUTIC & SURGICAL EQUIPMENTS
(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 Write the difference between External and Internal Pacemaker.
- 2 What are the three stages of Heart block?
- 3 Write the electrodes used with surgical diathermy.
- 4 Write the principle of high frequency heat therapy units.
- 5 What are the three types of dialyzers?
- 6 Define priming volume.
- 7 What are the two types of patient breathing system?
- 8 What are the types of oxygenators used in heart lung machine?
- 9 What are the mechanical aids used for artificial ventilation?
- 10 What is PEEP?

PART-B (5 x 16 = 80)

- 11 a. Differentiate external and implantable pacemaker in detail.
OR
b. Explain about Fibrillation problems and Mention how to treat Fibrillation problems.
- 12 a. Explain about surgical diathermy analysers.
OR
b. Narrate on Ultrasonic therapy unit.
- 13 a. Illustrate the stone disease problem and the need of lithotripters.

OR

(P.T.O)

b. Describe the principle of dialysis in artificial kidney.

14 a. Describe patient breathing system with suitable diagrams.

OR

b. Explain the types of artificial heart pumps and types of oxygenators.

15 a. Draw and explain the microprocessor controlled ventilator.

OR

b. Classify of ventilator based on : i) Methods of initiating the inspiratory flow ii) Pressure pattern
iii) Cycling from inspiration to expiration.

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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
BIOMEDICAL ENGINEERING
SEVENTH SEMESTER
ELECTIVE - BIOMEDICAL MICRO DEVICES

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Define Micro actuators.
- 2 Give the applications of MEMS in biomedical.
- 3 What is the principal of Acoustic wave sensor?
- 4 List out the application of microvalves.
- 5 Define micromachining.
- 6 Define spin coating.
- 7 Define hybrid system.
- 8 What are all the functions of micro mirrors?
- 9 List out the application of MEMS in Healthcare systems.
- 10 List out the application of E-nose.

PART-B (5 x 16 = 80)

- 11 a. Discuss about Micro actuation using Electrostatic forces with neat diagram.

OR

- b. Elaborate about Single crystal silicon and wafers with neat diagram.

- 12 a. Write short Notes on: a) Actuation using Thermal forces
b) Actuation using Shape memory alloys.

OR

- b. Discuss about Microaccelerometers with neat diagram.

- 13 a. Elaborate on surface micromachining process with neat diagram.

OR

(P.T.O)

b. With neat diagram explain about the Wet etching process.

14 a. Elaborate light detectors with neat diagram.

OR

b. Discuss in detail about beam splitter with neat diagram.

15 a. Discuss about construction and working principle of micro pumps with neat diagram.

OR

b. Explain the surface stress method of DNA probe with neat diagram.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
PROFESSIONAL ETHICS AND HUMAN VALUES
(COMMON TO BME, ECE, MECT)
SEVENTH SEMESTER

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What is service learning?
- 2 Differentiate Moral and Ethics.
- 3 What are personal ethics and business ethics?
- 4 What is descriptive ethics or non-normative ethics?
- 5 Give the principles of experimental control.
- 6 What are the central elements of collegiality?
- 7 Compare 'safety' and 'risk'.
- 8 What do you mean by technology transfer?
- 9 Differentiate External Whistle Blowing and Internal Whistle Blowing.
- 10 What are the important forms of conflicts that may arise for an engineering project manager?

PART-B (5 x 16 = 80)

- 11 a. List out the objectives of professional ethics.
OR
b. Distinguish values from ethics and culture.
- 12 a. Explain variety of moral issues in detail.
OR
b. List out the drawbacks of Rights Ethics. How do we prioritize the rights of different individuals?
- 13 a. What are the ethical lessons, we learned from space shuttle challenger tragedy?
OR
b. Briefly explain any two case studies which will help us to learn from the past in ethical aspects in engineering.
- 14 a. "What may be safe for one person may not be safe for the others"- Discuss.
OR
b. What is risk benefit analysis? Explain the different analytical method used when testing is inappropriate.
- 15 a. Write down the highlight of code of ethics in ASCE guidelines
OR
b. Enumerate the role of engineers as managers.
