Hall Ticket Number :										

R-17

Code: 7GC14

I B.Tech. I Semester Supplementary Examinations November 2019

Engineering Mathematics-I

(Common to All branches)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Define the rank of the matrix and find the rank of the following matrix

$$\begin{bmatrix} 2 & 1 & 3 & 5 \\ 4 & 2 & 1 & 3 \\ 8 & 4 & 7 & 13 \\ 8 & 4 & -3 & -1 \end{bmatrix}$$ 7M

b) Test for consistency and solve 5x+3y+7z=4, 3x+26y+2z=9, 7x+2y+10z=5 7M

OR

2. Find the eigen values and the corresponding eigen vectors of $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$ 14M

UNIT–II

3. a) Reduce the quadratic form $10x^2 + 2y^2 + 5z^2 - 4yz - 10zx + 5xy$ to the canonical form by linear transformation. 7M

b) Prove that the matrix $\frac{1}{\sqrt{3}}\begin{bmatrix} 1 & 1+i \\ 1-i & -1 \end{bmatrix}$ is Unitary matrix. 7M

OR

4. Reduce the quadratic form $2x_1x_2 + 2x_1x_3 - 2x_3x_2$ to canonical form by an orthogonal reduction and discuss its Nature. Also find the model matrix. 14M

UNIT–III

5. a) The number N of bacteria in a culture grew at a rate proportional to N. the value of N was initially 100 and increased to 332 in one hour. What was the value of N after $1\frac{1}{2}$ hours? 7M

b) Prove that the system of parabolas $y^2 = 4a(x + a)$ is self orthogonal. 7M

OR

6. a) A body is kept in air with temperature 25^0c cools from 140^0c to 80^0c in 20 minutes. Find the when the body cools down to 35^0c 7M

b) A bacterial culture, growing exponentially, increases from 200 to 500 grams in 1 hour. How many grams will be present after 90 minutes? 7M

UNIT–IV

7. a) Solve $\left(D^2-4D+3\right)y=\sin 3x\cos 2x$ 7M

   b) Solve $\frac{d^3y}{dx^3}-y=e^x+\sin 3x+2$ 7M

OR

8. Solve $\frac{d^2y}{dx^2}-3\frac{dy}{dx}+2y=xe^{3x}+\sin 2x$ 14M

UNIT–V

9. a) If $x+y+z=u, y+z=uv, z=uvw, then\ evaluate \frac{\partial(x,y,z)}{\partial(u,v,w)}$ 7M

   b) Find the first and second order partial derivatives of $f\left(x,y\right)=ax^2+2hxy+by^2$ and verify $\frac{\partial^2 f}{\partial x\partial y}=\frac{\partial^2 f}{\partial y\partial x}$ 7M

OR

10. Find the three positive numbers whose sum is 100 and whose product is maximum. 14M

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Hall Ticket Number :										

R-17

Code: 7GC13

I B.Tech. I Semester Supplementary Examinations November 2019

Engineering Physics

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Derive an expression for acceptance angle of an optical fiber. How it is related to numerical aperture? 8M

   b) Write a note on applications of optical fibers in the field of sensors and medicine. 6M

OR

2. a) Draw the block diagram of fiber optic communication system and explain the function of each block. 8M

   b) What is meant by diffraction of light? Describe the formation of grating spectrum. 6M

UNIT–II

3. a) State and explain miller indices. 10M

   b) Sketch the crystal planes and directions of Miller Indices (110), (101), [200], [211] 4M

OR

4. a) What are the various methods for producing ultrasonics? 7M

   b) Explain the applications of ulrasonics in non-destructive testing materials. 7M

UNIT–III

5. a) Discuss the origin of formation of energy bands 10M

   b) Explain the classification of metals, semiconductors and insulators based on band theory. 4M

OR

6. a) Derive Schrodinger's one dimensional time independent wave equation for a free particle. 9M

   b) Explain the physical significance of wave function. 5M

UNIT–IV

7. a) Write the direct and indirect band gap semiconductors and give their sketches. 7M

   b) Explain the construction and working of light emitting diode (LED) and describe its advantages. 7M

OR

8. Outline the following
   i. Magnetic Susceptibility
   ii. Magnetic permeability
   iii. Derive the relation between B,H and M
   iv. Photodiode 14M

UNIT–V

9. Describe the basic principles of Nano materials causing the change in its properties. 14M

OR

10. a) Describe the differences between type-1 and type-2 superconductors with neat diagrams. 8M

    b) Write a note on flux quantization. 6M

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Hall Ticket Number :										

R-17

Code: 7G311

I B.Tech. I Semester Supplementary Examinations November 2019

Fundamentals of Electrical & Electronics Engineering

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. Classify the types of capacitors and explain any four with neat diagrams. 14M

OR

2. a) Differentiate ideal and practical sources and draw their equivalent circuits. 10M

   b) What is capacitance? Draw symbol of capacitor and write its voltage, current, energy relations. 4M

UNIT–II

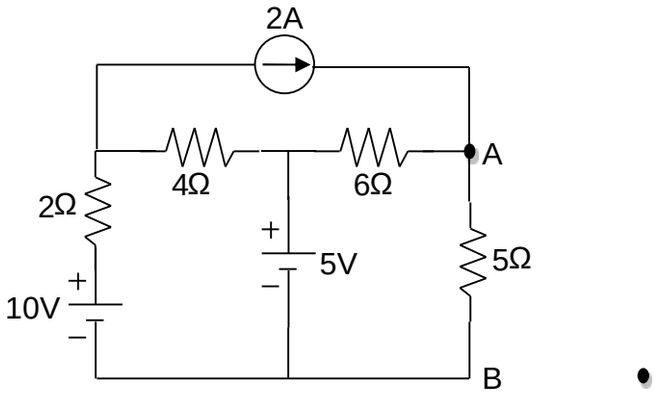
3. a) Determine the equivalent inductance when three inductors with values 4H, 5Hand 6H are connected in parallel. 4M

   b) Determine the equivalent capacitance when three capacitors with values 3F, 4Fand 6F are connected in series. 4M

   c) State and explain Thevenin's theorem. 6M

OR

4. a) Find the current through 5Ω resistor using superposition theorem for the circuit shown below.



14M

UNIT–III

5. a) Draw and explain the characteristics of PN junction diode. 10M

   b) How a PN junction diode acts as a switch? Explain. 4M

OR

6. a) Draw and explain the V-I characteristics of Zener diode. 10M

   b) What is mean by avalanche breakdown? Explain. 4M

UNIT–IV

7. A half wave rectifier circuit is supplied from a 230V,50 Hz supply with a step down ratio of 3:1 to a resistive load of 10kΩ. The diode forward resistance is 75Ω while the transformer secondary resistance is 10Ω. Calculate maximum, average, RMS values of current, DC output voltage, effiency of rectification and ripple factor. 14M

OR

8. a) Explain the operation of full wave rectifier with neat diagrams. 10M

   b) List the merits and demerits of LC filter. 4M

UNIT–V

9. a) With neat diagram explain the various current components of NPN transistor. 8M

   b) Derive the relation between α and β 6M

OR

10. a) Explain the operation of function generator with neat diagram. 14M

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Hall Ticket Number :										

R-17

Code: 7G111

I B.Tech. I Semester Supplementary Examinations November 2019

Problem Solving Techniques and C Programming

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1.	a)	Give a comparison between system and application softwares with examples.	7M
	b)	Write an algorithm to find the greatest number among the three given numbers.	7M

OR

2.	a)	Discuss about different computer languages with examples.	7M
	b)	Describe the process of program development.	7M

UNIT–II

3.	a)	Describe the structure of a C program with example	7M
	b)	What is the purpose of the comma operator? Within which control statement does the comma operator usually appear?	7M

OR

4.		Explain with examples the different types of operators used in C.	14M

UNIT–III

5.	a)	Differentiate between if statement and if-else statement with suitable examples and proper syntax.	7M
	b)	Give the control flow diagram of the *for loop*. How is the execution of 'for' loop proceeds?	7M

OR

6.	a)	Discuss selection statements with suitable examples for each.	7M
	b)	Write a C program to check whether a given number is Palindrome or not	7M

UNIT–IV

7.	a)	Define an array. Write a program to find the largest and smallest element in a given array	7M
	b)	Write a 'C' program to read a string from keyboard and print the numbers of uppercase letters, lower case letters, digits, spaces and special characters.	7M

OR

8.	a)	What is meant by arrays of strings? When it will be used? Explain with a 'C' program.	7M
	b)	Write a C program that reads characters from the keyboard and writes them to a disk file until the user types a dollar sign.	7M

UNIT–V

9.	a)	What is the scope of variables of type extern, auto, register and static? Explain with example.	10M
	b)	What is meant by user defined function? Explain with an example C program	4M

OR

10.	a)	Explain about calling function, called function and actual and formal arguments.	7M
	b)	Compare call by value and call by reference and explain using suitable example	7M

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Hall Ticket Number :										

R-17

Code: 7GC11

I B.Tech. I Semester Supplementary Examinations November 2019

Technical English and Professional Communication

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Explain the alternative technology suggested by E.F.Schumacher to make things better, in " Technology with a Human Face"

   b) Fill in the blanks in the following sentences using the hints given in brackets

      i) Be bold. Don't act weak and _____. (a word with the suffix –less)

      ii) They own an acre of ***fertile*** land in the village. (Replace the italicized word with its Antonym)

      iii) The man stared _____ the paper in his hand (towards/at)

      iv) The music is too loud. Could you _____ the volume please? (turn down/ turn up)

      v) Can I have a _____, please? (pear/pare)

OR

2. What are the key elements of communication? Explain.

UNIT–II

3. a) What are the main ways in which human development has affected climate patterns on the earth?

   b) Write a letter of application in response to an advertisement for the post of Software developer in Google solutions, Hyderabad.

OR

4. Discuss flow of Communication? Illustrate it with examples.

UNIT–III

5. a) Discuss two kinds of technologies currently used to generate solar power on a large scale.

   b) Complete the following sentences with appropriate words chosen from those in brackets.

      i) I just read a story about a man without a _____. (Shade/Shadow)

      ii) There is a _____ shop on the campus. (Stationery/Stationary)

      iii) It was not a _____ thing to do. (Sensible/Sensitive)

      iv) Everyone said that the Court's verdict was_____. (Fare/Fair)

      v) To prove his points, he ____ an example. (Cited/Sited)

OR

6. Explain the significance of Proxemics and Kinesics in effective communication?

UNIT–IV

7. a) How according to Sir C.V. Raman, can rainwater as well as the water of rivers be prevented from going waste?

   b) You have been asked to write a report on the infrastructure (furniture, equipment, classroom, workshops, labs, computer centers, hostels and libraries) available in your college.

OR

8. Define Noise? Classify different barriers of communication?

UNIT–V

9. According to Swami Vivekananda, what are the two ways in which one can work without expecting anything in return?

OR

10. Explain briefly four communication models and its importance?

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