Hall Ticket Number :										

R-17

Code: 7GC14

I B.Tech. I Semester Supplementary Examinations May / June 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) Reduce the matrix $A=\begin{bmatrix}1 & -1 & 2 & -1\\ 4 & 2 & -1 & 2\\ 2 & 2 & -2 & 0\end{bmatrix}$ into its Echelon form and hence find its rank. 7M

   b) Test for Consistency of the following equations and if possible find the solution $2x+2y+4z=18$; $x+3y+2z=13$; $3x+y+3z=14$. 7M

OR

2. a) Find the Eigen values and Eigen vectors of the matrix $A=\begin{bmatrix}1 & 1 & 3\\ 1 & 5 & 1\\ 3 & 1 & 1\end{bmatrix}$. 7M

   b) Verify Cayley-Hamilton theorem for the matrix $A=\begin{bmatrix}2 & -1 & 1\\ -1 & 2 & -1\\ 1 & -1 & 2\end{bmatrix}$ and hence find its inverse. 7M

UNIT–II

3. a) Reduce the quadratic form $x_1^2+3x_2^2+3x_3^2-2x_2x_3$ into canonical form and also write the nature of the quadratic form. 7M

   b) Show that $B=\begin{bmatrix}3i & 2+i\\ -2+i & -i\end{bmatrix}$ is Skew-Hermitian. Find its Eigen values. 7M

OR

4. a) Find a matrix P which diagonalizes the matrix $A=\begin{bmatrix}4 & 1\\ 2 & 3\end{bmatrix}$.

   Verify that $P^{-1}AP=D$. 7M

   b) Prove that the Eigen values of Hermitian matrix A are real. 7M

UNIT–III

5. a) Solve $\sec^2 y\,\frac{dy}{dx}+x\tan y=x^3$. 7M

   b) Find the orthogonal trajectory of the cardioids $r=a(1-\cos^{-})$. 7M

OR

6. a) Solve $\frac{dy}{dx}+\frac{y\log y}{x-\log y}=0$. 7M

   b) Radium disintegrates at a rate proportional to its mass.When mass is 10 mgm, the rate of disintegration is 0.051 mgm per day. How long will it take for the mass to be reduced to 10 to 5 mgm? 7M

UNIT–IV

7. a) Solve $\frac{d^2y}{dx^2}-2\frac{dy}{dx}+y=x\,e^x\sin x$. 7M

   b) Solve the following ODE by the method of variation of parameters:

   $\frac{d^2y}{dx^2}+a^2y=\sec ax$. 7M

OR

8. a) Solve $\frac{d^2y}{dx^2}-3\frac{dy}{dx}+2y=xe^{3x}+\sin 2x$. 7M

   b) The damped LCR circuit is governed by the equation $L\frac{d^2q}{dt^2}+R\frac{dq}{dt}+\frac{q}{C}=0$ where L,R,C ate positive constants. Find the conditions under which the circuit is over damped, under damped and critically damped. 7M

UNIT–V

9. a) Verify Lagrange's Mean value theorem for $f(x)=(x-1)(x-2)(x-3)$ in $[0,4]$. 7M

   b) Find the minimum value of $x^2+y^2+z^2$,given that $xyz=a^3$. 7M

OR

10. a) Determine whether the following functions are functionally dependent or not. If functionally dependent, find the functional relation between them:

    $u=\sin^{-1}x+\sin^{-1}y,\quad v=x\sqrt{1-y^2}+y\sqrt{1-x^2}$. 7M

    b) Find the maximum and minimum values of $f(x,y)=x^3+y^3-3axy$. 7M

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Hall Ticket Number :										

R-17

Code: 7G111

I B.Tech. I Semester Supplementary Examinations May / June 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)	Explain the various problem solving strategies with example.	7M
	b)	Write an algorithm to find the greatest number among 3 numbers	7M

OR

2.	a)	Differentiate between high level and low level language with example	7M
	b)	What do you mean by error in a program? Explain the strategies to handle the error.	7M

UNIT–II

3.	a)	Classify the operators in “C” with example.	7M
	b)	Explain the structure of a C program with an example.	7M

OR

4.	a)	Explain the primitive data types of C with example.	8M
	b)	Explain type conversion in c	6M

UNIT–III

5.	a)	Write a C program to illustrate the working of jump statements break and continue	8M
	b)	Explain the “nested if “concept of C by an example.	6M

OR

6.	a)	Write a C Program to Display Fibonacci Sequence of 8 numbers	7M
	b)	Write the concept of “do while” and “while”. When to use do while in a program explain with an appropriate example.	7M

UNIT–IV

7.	a)	Write a C Program to Find the Frequency of Characters in a String	7M
	b)	Explain the applications of String with suitable example.	7M

OR

8.	a)	Write a program to find the smallest number of an integer array. A={34, 45,6, 7,89}	7M
	b)	Write a C Program to Copy String Without Using strcpy()	7M

UNIT–V

9.	a)	Explain various type of qualifiers in C language. Write the importance of “Static” key word.	7M
	b)	Write a program using function to design an arithmetical calculator.	7M

OR

10.	a)	Explain the concept of pre-processor commands.	7M
	b)	Write a C Program to Find GCD Using Recursion.	7M

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Hall Ticket Number :										

R-17

Code: 7GC11

I B.Tech. I Semester Supplementary Examinations May / June 2019

Technical English & Professional Communication

(Common to All Branches)

Max. Marks: 70 Time: 4 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) Why does E.F.Schumacherstate that modern technology does not enrich man but empties him?

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

   i. He was not happy with her decision. He may _____ with her. (a word with the prefix dis_)
   ii. He enjoys_____ his friends. (to meet/ meeting)
   iii. Good sleep is _____to health. (beneficial/benificial)
   iv. Rita _____ from the shock of her uncle's death. (Phrasal verb with 'get')
   v. Anything written in a letter after it is signed is known as _____. (postscript/postdiction)

OR

2. Discuss the different elements of human communication?

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 Project Manager in a reputed software company.

OR

4. Discuss the different levels of communication.

UNIT–III

5. a) What are the 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. How many _____ are there in each character in MS Word? (bytes/bites)
   ii. Students are given an essay about the human _____ in the exam. (soul/sole)
   iii. We saw a_____ and a tiger when we visited the local zoo.(boar/bore)
   iv. Our _____took us through the Alps and then on to Italy. (route / root)
   v. When it's low _____ you have to walk a long way before you can swim. (tide/tied)

OR

6. Explain the different types of Non-verbal communication in brief?

UNIT–IV

7. a) What are the measures to be taken to prevent soil erosion?

   b) Correct the following sentences

   i. The second innings are going on now
   ii. Either Ramu or Somu might offer their services.
   iii. My friend sits besides me in the class
   iv. Each of the candidates were awarded a certificate.
   v. One must love his parents.

OR

8. Discuss the different types of listening.

UNIT–V

9. How the idea of 'samskara' is explained in the essay "The Secret of Work"?

OR

10. Write about Linear, Interactive and Transactional communications.

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Hall Ticket Number :										

R-17

Code: 7G513

I B.Tech. I Semester Supplementary Examinations May / June 2019

Basic Engineering Drawing

(Computer Science and Engineering)

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 fixed point F is 3.5 cm from a fixed straight line. Draw the locus of point P moving in such a way that its distance from the straight line is equal to its distance from F. Name the curve and draw the tangent and normal at any point on the curve. 14M

OR

2. A circus man rides a motor bike inside a globe of 6 m diameter. The motor bike has the wheel of 1 m diameter. Draw the locus of the point on the circumference of the motor bike wheel for one complete revolution. Adopt suitable scale. 14M

UNIT–II

3. One end P of a line PQ, 55 mm long is 35 mm in front of VP and 25 mm above HP. The line is inclined at 40º to HP and 30º to VP. Draw the projections of PQ. 14M

OR

4. The top view of a 75 mm long line AB measure 65 mm while the length of its front view is 50 mm. Its one end A is in H.P and 12 mm in front of the V.P. Draw the projections of AB and determine its inclinations with the H.P and the V.P 14M

UNIT–III

5. A square lamina PQRS of side 40 mm is resting on the ground on its corner P in such way that the diagonal PR is inclined at 45º to HP and apparently inclined at 30º to the VP. Draw its projections. 14M

OR

6. A hexagonal plate of side 30 mm is resting on one of its sides on VP and inclined at 40° to HP. Its surface is inclined at 35° to VP. Draw its projections. 14M

UNIT–IV

7. A pentagonal prism of base side 30mm and axis length 60 mm is resting on HP on one of its base corners with its axis inclined at 45° to HP and parallel to VP. Draw its projections when the base sides containing the resting corners are equally inclined to HP. 14M

OR

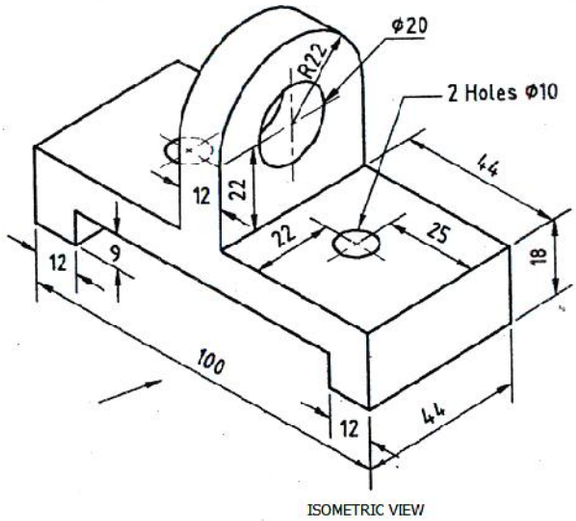
8. A cone of base diameter 40 mm and axis length 50 mm is resting on VP on a point on the circumference of the base with its base inclined at 30° to VP and parallel to HP. Draw its projections. 14M

UNIT–V

9. A cylinder of base 50mm diameter and 75mm long is lying on the HP. Draw its isometric projection when the axis is horizontal. 14M

OR

10. Draw the three possible orthographic views of the object shown in figure.



ISOMETRIC VIEW

14M

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Hall Ticket Number :										

R-17

Code: 7GC12

I B.Tech. I Semester Supplementary Examinations May / June 2019

Engineering Chemistry

(Common to CE, ME and CSE)

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) What are ion exchange resins? Explain the ion exchange method of water softening 7M
   b) What is hard water? Explain the types of hardness and disadvantage of hard water 7M

OR

2. a) Determine the temporary, permanent & total hardness of a hard water sample containing $Ca(HCO_3)_2$ = 70.5 mg/L, $Mg(HCO_3)_2$ = 60.5 mg/L, $MgSO_4$=27.6 mg/L, $CaSO_4$=52.1 mg/L. 7M
   b) Write a note on
   (i) Priming and foaming (ii) Scale and sludge formation in boiler 7M

UNIT–II

3. a) Describe the construction and working of lithium ion battery 7M
   b) An electrochemical cell consists of an iron electrode, dipped in 0.1M $FeSO_4$ and silver electrode dipped in 0.05M $AgNO_3$ solution. Calculate the emf of the cell at 298K. Given SRP of Fe and Ag are -0.44 and +0.8V respectively. 7M

OR

4. a) Discuss the different types of conductometric titrations with examples 7M
   b) Explain the construction and working of Hydrogen-Oxygen fuel cell 7M

UNIT–III

5. a) Differentiate between thermoplastics and thermosetting plastics 6M
   b) Explain the preparation, properties and applications of PVC and PE 8M

OR

6. a) Write a brief note on Vulcanization and compounding of rubber 8M
   b) Explain the preparation, properties and applications of polyphosphazenes 6M

UNIT–IV

7. a) What are chemical fuels? Give the classification of fuels with examples 6M
   b) A sample of Coal on analysis was found to contain the following. C=85.0%, H_2=5.2%, O_2 = 4.0%, S = 2.1%, N_2 = 3.5%, and ash = 0.2%. Calculate the quantity of air required for complete combustion of 1 kg of this coal 8M

OR

8. Describe the Otto Hoffmann's method of manufacture of metallurgical coke with a neat labelled diagram. How do you recover the byproducts in this method 14M

UNIT–V

9. a) Describe the essential properties of a good refractory material. 8M
   b) Discuss the following properties of lubricants (i) Cloud and pour point (ii) Aniline point 6M

OR

10. a) What is cement? Explain with the help of chemical reaction setting and hardening of cement 7M
    b) What is Portland cement? Illustrate the manufacture of Portland cement by dry method with a neat labelled diagram of rotary kiln 7M

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