Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC1101

I B.Tech I Semester Supple Examinations, October-2020
FUNCTIONAL ENGLISH
(Common to CE, EEE, ME, ECE & CSE)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) On what situation is the story 'An Astrologer's Day' based on?
   (b) Why was Kalam filled with a sense of disappointment at the Bokaro Steel plant?
   (c) What are the main causes of soil erosion?
   (d) Why does the narrator of 'Woodrose' initially dislike the idea of planting the woodrose?
   (e) What did Mrs Meldon say about Eddie's death?
   (f) Expand the proverb 'Better late than never'.

                                                                 [2+2+2+2+2+2]

PART-B

                                                                 4 X 12 = 48

2. (a) What techniques did the astrologer use to surprise and satisfy his customers? Also describe how luck helped him in handling difficult situations?
   (b) Correct errors, if any, in the following sentences and rewrite them.
       (i) My dog has three puppys.
       (ii) I drink two teas every day.
       (iii) Cut these tomatoes into halfs.
       (iv) Do you know his fathers name?
       (v) This is Ashas' bag.

                                                                 [7+5]

3. (a) What are Kalam's thoughts on the education system and potential improvements that could be made to it?
   (b) Write a paragraph of five to six lines on 'Advantages of Vegetarianism'.

                                                                 [7+5]

4. (a) Why is water called 'The Elixir of Life' by C.V. Raman?
   (b) Write one word substitutes for the following sentences.
       (i) Capable of being understood in two or more ways: _____
       (ii) Suitable or safe for eating: _____
       (iii) A detailed plan of a journey: _____
       (iv) That which cannot be believed: _____
   (c) Rewrite the following sentences with single words.
       (i) Your writing is impossible to read: _____
       (ii) The dancer gave a presentation without any preparation or thought: _____
       (iii) The speaker was not able to be heard at the back of the auditorium: _____

                                                                 [7+2+3]

5. (a) Why is the narrator of 'Woodrose" upset when she finds out her son's reasons for cutting the creeper?

(b) Fill in the blanks with suitable prepositions.

(i) The bag is _____ the top of the cupboard.

(ii) Mini's clients are happy _____ her work.

(iii) We are sorry _____ having disturbed you.

(iv) Rani spoke harshly _____ Simon.

(v) The building is completely occupied _____ tenants.

[7+5]

6. (a) Do you think Corrie remembers his nephew fondly? Substantiate your answer.

(b) Match the words given in column A with their meanings in column B.

	Column A			Column B
1	dispatch	(	)	(a) a material that burns easily
2	in the pipeline	(	)	(b) to make a signal stronger
3	flammable	(	)	(c) check
4	amplify	(	)	(d) under preparation/production
5	monitor	(	)	(e) to send out

[7+5]

7. (a) You are Susan Paul of Pioneer Book Store, Bangalore. You sell university books on science and technology. Write a letter to the librarian of NEC, quoting for a cost effective order.

(b) Write an **antonym** for each of the words given below.

(i) amicable

(ii) consent

(iii) dormant

(iv) paucity

(v) refute

[7+5]

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Subject Code: R16CC1102

I B.Tech I Semester Supple Examinations, October-2020
ENGINEERING MATHEMATICS
(Common to CE, EEE, ME, ECE & CSE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Solve $y \sin 2x \, dx - \left(1 + y^2 + \cos^2 x\right) dy = 0$

   (b) Find the particular integral of the differential equation $\left(D^2 + D + 1\right) y = \sin 2x$

   (c) Verify Rolle's theorem for $f(x) = x^2$ in [-1, 1]

   (d) If $z = f(x + ct) + \phi(x - ct)$, prove that $\dfrac{\partial^2 z}{\partial t^2} = c^2 \dfrac{\partial^2 z}{\partial x^2}$

   (e) Form the partial differential equation by eliminating the arbitrary functions from $z = f(x + at) + g(x - at)$

   (f) Solve the equation $3\dfrac{\partial u}{\partial x} + 2\dfrac{\partial u}{\partial y} = 0, \; u(x,0) = 4e^{-x}$ by method of separation of variables.

   [2+2+2+2+2+2]

PART-B

4X 12 = 48

2. (a) Solve $(y \log x - 2) y \, dx - x \, dy = 0$

   (b) Find the orthogonal trajectory of a system of confocal and coaxial parabolas.

3. (a) By the method variation of parameters, solve $y'' - 6y' + 9y = \dfrac{e^{3x}}{x^2}$

   (b) A circuit consists of an inductance of 2 henrys, a resistance of 4 ohms and capacitance 0.05 farads. If $q = i = 0$ at $t = 0$, find
   (i) $q(t)$ and $i(t)$ when there is a constant emf of 100 volts; and (ii) steady state solution.

4. (a) Given $0 < a < b$, prove that $\dfrac{b-a}{1+b^2} < \tan^{-1} b - \tan^{-1} a < \dfrac{b-a}{1+a^2}$. Hence show that $\dfrac{\pi}{4} + \dfrac{3}{25} < \tan^{-1}\left(\dfrac{4}{3}\right) < \dfrac{\pi}{4} + \dfrac{1}{6}$

   (b) A window has the form of a rectangle surmounted by a semi-circle. If the perimeter is 40 ft, find its dimensions so that the greatest amount of light may be admitted.

5. (a) If $u = f(x-y, y-z, z-x)$, show that $\dfrac{\partial u}{\partial x} + \dfrac{\partial u}{\partial y} + \dfrac{\partial u}{\partial z} = 0$

   (b) Divide 24 into three parts such that the continued product of the first, square of the second and the cube of the third may be maximum.

6. (a) Solve $(x^2 - yz)p + (y^2 - zx)q = z^2 - xy$

   (b) Solve $4\dfrac{\partial^2 z}{\partial x^2} - 4\dfrac{\partial^2 z}{\partial x \partial y} + \dfrac{\partial^2 z}{\partial y^2} = 16\log(x+2y)$

7. A string is stretched and fastened to two points l apart. Motion is started by displacing the string in the form $y = a\sin\left(\dfrac{\pi x}{l}\right)$ from which it has released at time $t = 0$. Show that the displacement of any point at a distance x from one end at time t is given by $y(x,t) = a\sin\left(\dfrac{\pi x}{l}\right)\cos\left(\dfrac{\pi ct}{l}\right)$.

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Narasaraopeta Engineering College (Autonomous)
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC1103

I B.Tech I Semester Supple Examinations, October-2020
MATHEMATICAL METHODS
(Common to CE, EEE, ME & ECE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) If $A + B = \begin{bmatrix} 1 & -1 \\ 3 & 0 \end{bmatrix}$ and $A - B = \begin{bmatrix} 3 & 1 \\ 1 & 4 \end{bmatrix}$ calculate the product AB.

   (b) Prove that the quadratic form $6x_1^2 + 3x_2^2 + 3x_3^2 - 4x_1x_2 - 2x_2x_3 + 4x_3x_1$ in the three variables is positive definite.

   (c) Sketch the region of integration for $\int_0^1 \int_0^x f(x,y)\, dy\, dx.$

   (d) By bisection method, identify the interval in which positive roots of the equation $3x^3 + 5x - 40 = 0$ lies.

   (e) If $f(x) = e^{ax+b}$, show that its leading differences form a geometric progression.

   (f) Write the formula to find solution of first order ordinary differential equations by Taylor's series method.

[2+2+2+2+2+2]

PART-B

4X 12 = 48

2. (a) Reduce the following matrix into its normal form and hence find its inverse
$$\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}.$$

   (b) Apply Gauss elimination method to solve the equations
$$x + 4y - z = -5$$
$$x + y - 6z = -12$$
$$3x - y - z = 4$$

3. (a) Find the eigen values and eigen vectors of the matrix $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}.$

(b) Using Cayley-Hamilton theorem find the inverse of $\begin{bmatrix} 1 & 1 & 2 \\ 0 & -2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$

4. (a) Transform into polar coordinates and evaluate $\int_0^2 \int_0^{\sqrt{2x-x^2}} \frac{x}{x^2+y^2} \, dy \, dx$.

(b) Evaluate $\int_0^{\log 2} \int_0^x \int_0^{x+y} e^{x+y+z} \, dx \, dy \, dz$.

5. (a) Find the positive root of the equation $x^3 - 8x + 8 = 0$ other than 2, by the method of simple iteration, correct to 3 places of decimals.

(b) Find the root of the equation $e^x = 2x + 1$ correct to 4 places of decimals, using Newton-Raphson method.

6. (a) Given $\sin 45^\circ = 0.7071, \sin 50^\circ = 0.7660, \sin 55^\circ = 0.8192, \sin 60^\circ = 0.8660$ find $\sin 52^\circ$, using Newton's forward formula.

(b) Given the values

x:	5	7	11	13	17
f(x):	150	392	1452	2366	5202

Evaluate f(6), using Newton's divided difference formula.

7. (a) Apply Runge-Kutta method of fourth order to find an approximate value of y when $x = 0.2$ given that $\frac{dy}{dx} = x + y$ and $y = 1$ when $x = 0$.

(b) Evaluate $\int_0^{\pi/2} e^{\sin x} \, dx$, correct to 4 decimal places using Simpson's 3/8th rule.

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Narasaraopeta Engineering College (Autonomous)
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC1104

I B.Tech I Semester Supple Examinations, October-2020
PROGRAMMING WITH C
(Common to CE, EEE & ME)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Define an algorithm? Also write an algorithm for sum of two numbers?
   (b) How two-dimensional arrays are declared and initialized?
   (c) List various storage classes in C?
   (d) What are the built-in functions for allocating memory in C language dynamically?
   (e) Mention two differences between structure and union?
   (f) What is fprintf ()?

[2+2+2+2+2+2]

PART-B

4X 12 = 48

2. (a) Explain the structure of a c program.

   (b) What is token? Explain all c tokens.

3. (a) Differentiate while and do-while with example.

   (b) What is an array? Explain 2-D array.

4. (a) Differentiate between Call by Value and Call by Reference.
   (b) Write a program to print Fibonacci sequence using function.

5. (a) What are the functions for dynamic memory management? Explain.
   (b) Write a program to swap two numbers using copy by address.

6. (a) How to declare and initialize structures? Explain with examples.
   (b) Write C program to print student grade using structures. Take input your individual subject marks.

7. (a) What is a file? Explain file I/O functions.
   (b) Write a program to copy the contents of file to another file

Subject Code: R16CC1105
I B.Tech I Semester Supple Examinations, October-2020
ENGINEERING CHEMISTRY
(Common to CE, EEE & ME)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Differentiate scale and sludge. How are they minimized?
   (b) Relate how is PVC prepared? State the advantage of rigid PVC?
   (c) Write about nematic liquid crystals?
   (d) Point out the role of drying and non-drying oils in paints?
   (e) Express why HCV value higher than LCV value?
   (f) Define Stark Einstein law.

[2+2+2+2+2+2]

PART-B

4X 12 = 48

2. (a) Explain (i) calgon conditioning (ii) boiler corrosion due to dissolved CO_2 and $MgCl_2$
   (b) Describe briefly how hardness of water can be estimated? Calculate the total hardness of a sample of water containing $Mg(HCO_3)_2$ = 16 mg/L, $Ca(HCO_3)_2$ = 16.2 mg/L, $CaCO_3$ = 20 mg/L.

3. (a) Define addition polymerization? Explain cationic mechanism of addition polymerization?
   (b) Discuss the additives added during compounding of plastics.

4. (a) What are solar cells? Explain the construction and working of photovoltaic cells?
   (b) Explain the manufacture process of Portland cement.

5. (a) Explain the various methods of applications of metal to control corrosion.
   (b) Define primary and secondary cells. Explain the working of nickel cadmium cell.

6. (a) Explain how N, C, H, S can be determined in a coal sample.
   (b) Describe Fisher's Tropsch method for preparation of synthetic petrol.

7. (a) Explain photosensitization with examples.
   (b) Discuss the applications of photochemistry.

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Subject Code: R16CC1107

I B.Tech I Semester Supple Examinations, October-2020
ENGINEERING GRAPHICS
(Common to ECE & CSE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Difference between comparative and diagonal scales.
   (b) Difference between first angle and third angle projection
   (c) Define traces of a line.
   (d)Name the methods to determine the true length and true inclinations of a straight line.
   (e) What are the types of plane?
   (f) What is an isometric view?

                                                                [2+2+2+2+2+2]

PART-B   **4X 12 = 48**

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

3. The end P of a line PQ is 30 mm above HP and 35 mm in front of VP. The line is inclined at 35° to the HP. Its top view is 70 m long and inclined at 40° to the XY. Draw the projections of the straight line. Locate the traces. Find the true length and inclination of the line with VP.

4. A straight line ST has its end S, 10 mm in front of the VP and nearer to it. The midpoint m of the line is 50 mm in front of the VP and 40 mm above HP. The front and top view measure 90 mm and 120 mm respectively. Draw the projections of the line. Also find its true length and true inclinations with the HP and the VP

5. A pentagon of side 30 mm rests on the ground on one of its comers with the sides containing the comer being equally inclined to the ground. The side opposite to the comer on which it rests is inclined at 30° to the VP and is parallel to the HP. The surface of the pentagon makes 50° with the ground. Draw the top and front views of the pentagon

6. A cone of 15mm radius and 70mm height rests on the ground on one of its base circle points such that the apex is 20mm and the nearest base circle point is 50mm in front of VP and the base is perpendicular to HP. Draw the projections.

7. Draw the isometric view of the casting shown in the fig.

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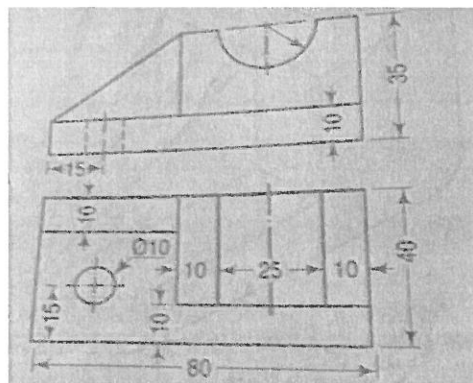
Subject Code: R16CC1108

I B.Tech I Semester Supple Examinations, October-2020
ENGINEERING PHYSICS
(Common to ECE & CSE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory
Four Questions should be answered from Part-B
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PART-A

1. (a) Why the centre of the Newton's ring is dark?
   (b) Distinguish between Spontaneous emission and stimulated emission.
   (c) Draw the crystal planes having Miller indices (101) and (111).
   (d) Write any four applications of ultrasonics.
   (e) What are matter waves? Write its properties.
   (f) What are intrinsic and extrinsic semiconductors?

[2+2+2+2+2+2]

PART-B

4X 12 = 48

2. (a) Distinguish between Fresnel and Fraunhofer diffraction.
   (b) Write a short note on types of polarisation.   [6+6]

3. (a) Describe the construction and working of a Ruby laser with neat diagram.
   (b) Define Numerical aperture. Derive the expression for numerical aperture.
   (c) Calculate the numerical aperture of a fiber with a core index of 1.54 and a cladding index of 1.50.   [6+4+2]

4. (a) Describe the seven crystal systems with diagrams.
   (b) State Bragg's law and write its limitations.   [8+4]

5. (a) What are ultrasonic waves? Explain how ultrasonic waves are produced using magnetostriction method?
   (b) What are the basic requirements of acoustically good hall?   [6+6]

6. (a) What are the failures of classical free electron theory?
   (b) Derive the expression for energy of a particle in a one dimensional potential box. [6+6]

7. (a) Explain how materials are classified into conductors, semiconductors and insulators?
   (b) What is Hall effect? Derive the expression for Hall coefficient. [6+6]

Subject Code: R16CS1110

I B.Tech I Semester Supple Examinations, October-2020
INTRODUCTION TO COMPUTERS AND PROBLEM SOLVING
(CSE)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Name any four input & output devices?
   (b) What is the importance of Cache Memory?
   (c) Convert a Decimal form – $(224)_{10}$ into - Binary form $(\ )_2$
   (d) What is Flow Chart? List & draw any four symbols used in Flow Chart?
   (e) Write an algorithm for Factorial Computation.
   (f) Define an array? Mention various factoring methods used in problem solving?

   $$[2+2+2+2+2+2]$$

PART-B

$$4X\ 12 = 48$$

2. (a) List out different Characteristics of Computers? **[6+6]**

   (b) Draw the block diagram of computer? And also explain each component.

3. Define a Memory? Explain in detail about Memory Hierarchy? **[12]**

4. Convert the following   **[4+3+3+2]**
   i) $(11000111010)_2 - (----)_{10}$
   ii) $(1010110011101)_8 - (--------)_2$
   iii) $(1111100110101)_{16} - (----)_{10}$
   iv) 2's compliment of $(10011101)_2$

5. Explain the problem solving aspect? Also compare top-down & bottom-up problem solving strategies.   **[12]**

6. (a) Write an algorithm for exchanging the values of two variables. **[6+6]**

   (b) Compose an algorithm for reversing the digits of an integer.

7. (a) Design an algorithm to find the Square Root of a Number. **[6+6]**

   (b) Write an algorithm using any loop to searching an element in an array.

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